MODEL AIRPLANE NEWS

SEPTEMBER 1951 - 25 CENTS

▶ We, the modelers, enjoy the scream of a hot powerplant trying to blow its top, but old man Jones living four houses down the street can't stand the racket, so calls the law. If the flyers aren't a bit diplomatic, a petition is taken around or the anti-noise law is flung in the circle and another field has gone "west."

Keeping a flying field means using diplomacy, soft soap, or just good horse sense. Get permission to use a field near or in the city for U-control flying, and then start laying the groundwork to keep it for that purpose at arranged times. Pick out some of the club members with a gift for selling such a promotion and let them canvass the neighborhood with their wares. Carefully plan the flying hours etc., and sell the powers that be on the idea of what the modelers are doing in other parts of the country. Give them a word picture of the Nationals and Internationals. Tell them about the nationally known sponsors of model meets. Let them know what the kids are getting out of it—besides just the kick of flying. These are all good selling points.

Now we get to Jones' house. He doesn't care if the whole town agrees the engine racket doesn't bother them —he doesn't want any part of it. Tell him of the flying hours and that when the time is up for flying the modelers will pack up and leave on schedule, leaving no debris behind such as gas cans, broken props, and tired ships. The flyers have to be salesmen. Work out your difficulties to the best of your abilities and do it *before a prop is ever flipped*. Let's keep the chip off our shoulders even though we've been kicked around from field to field. The big OK from almost all of the neighbors is swell, but you've gotta sell old man Jones your problems too. That long list of his neighbors telling him that they think it's a good idea for the flyers to have a little time in the local ball park may turn him to your way of thinking. The U-control field is about the toughest one to hold, although good flying sites for the f.f. models are getting a bit hard to find or hold. Communities are spreauing out and are getting closer to these fields. Models are flying faster, higher, and farther, but they all come down, one way or another. A dethermalized flight usually covers plenty of distance and most of the way is trekked by foot. Corn fields, flower beds, chicken yards, etc., are usually thought of as obstacle courses by most modelers.

"Envision a man, elderly in years, raising chickens," says Bob Buragas, of East Orange, N. J. "The coops, fences, and property represent a life's work. How could you cause him damage? Not so much by trampling down fences, stealing chickens, or littering his property. Most people exercise enough care to give him little trouble along these lines. But he really fears disease contamination of his stock.

'Think of a pinpoint dipped into a germ culture and that the amount which adheres represents millions of germs—and it takes only one germ to produce a disease which cultures millions more.' An alarmist attitude? Within ten days after last year's meet, in which many modelers trekked through his property, one farmer's chickens became contaminated by a disease which resulted in the loss of over $1000 worth of poultry in addition to the medical and veterinary fees. This disease is a recurrent type which requires yearly innoculation."

The flying site won't last too long if the man across the road or over in the next field is not considered when we plan our affairs. His permission and confidence is as important as that received from the contest field donor. Remember, the property owners are votes and votes run the city government. Permission to fly at any field can be revoked by adjacent property owners if the going gets too rough for them. It seems like only yesterday we were trotting after a long gone *Powerhouse* at the Nat's. The ship in the sky held our attention but the freshly irrigated cornfield sucked us in to the waist. We're afraid we didn't replace the divot!

Our good friends, the flying field operators and owners, are constantly lending a helping hand to establish flying sites. It's good for them from a business standpoint, as most of them really enjoy the sport, even if only as spectators. Infractions of general flying practices furrow many brows of these swell people. Landing strips, whether in use or not by light planes, are often used by the modelers for test purposes. A powerdive through an Ercoupe wing or a Taylorcraft's fuselage is usually frowned upon. Sending a model up into (*Continued on page* 4)

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CONTENTS

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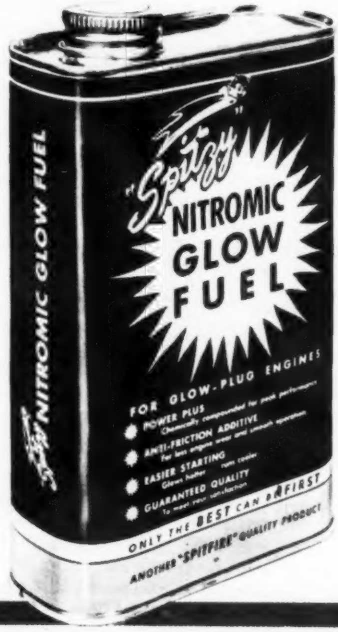

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(Continued from page 1)

the approach pattern for student flyers is also another good way to lose a flying site.

* * *

Radio control—you big juicy plum! Our feet have not only become wet, we have been thoroughly dunked, and we love it. We had backed way off with the spectators, content with being one of the amazed bystanders. Now we're in it with both feet. Brown, Butler, Patten, Bonner, and many others had been giving us the scoop right along on the fundamentals and basic principles of R.C. flying so the jump was finally made, and now the "cogs" are turning on an original for this type of flying. The present ship is the good old standby, the *Rudderbug*, powered with a *Torpedo .19*.

The first flight was made successfully in spite of too little rudder action. E. J. Brown test hopped the job for us and the climb was excellent, as were all other flight characteristics. The big moment arrived after a bit more rudder had been built in, and the *"Bug"* was in the air again with us at the control box. We let the ship climb to about 150 feet before applying right rudder. The ship swung around, neutral was given and she straightened out. Simple. Left and right banks were made and then the real thrill—a spin! From approximately 800 feet we started a slow spin which became more violent as the ship lost altitude; reverse rudder, then neutral, and we were out in a well controlled climb. The engine cut and we banked around into the wind, approached the take-off spot, reversed the turn and dropped in to touch the field, quite a bit further out then we had expected. Whatta feeling—we'd soloed!

This R.C. flying is right on the beam. For the rank amateur, such as us, there are quite a few sets on the market that are swell. *Aero-trol*, Radio Control Research, Good Brothers, McNabb, and others. The Citizens Band job requires no license and appears to be a mighty sharp piece of equipment, as are the others mentioned. You don't have to be a technician to adjust your unit but a little instruction from one of the "hep" boys helps a lot. Our first lesson amounted to watching the tuning of the receiver and transmitter, checking the batteries, and winding the escapement rubber before flying. Small doses seem more easily digested.

Jim Schenck's information about the Pittsburg Flying Circuit's 1951 Flight Schedule, which we covered briefly in our last column, gives the newer R.C. flyers something to go after without the feeling that they are taking too large a bite at one time. It is felt that the R.C. rules used at the Nationals are a bit rough. Many of the flyers feel that the A.M.A. standard type R.C. meet is too much of a rat race; that is, in order to win, one would have to work hard

all day in order to accomplish his objective. A fellow just has to have time to look at the other guy's equipment and watch his flights if only for educational purposes. Herb Owbridge and others would like to see some rule changes. A questionnaire sent to Walt Good, Foxworthy, Bonner, and a hundred other operators about a standardized radio event would start the ball rolling. Possibly a top limit of control complexity should be four-position rudder and some simple form of engine control.

While on the subject of engine control, for glo-plugs, we'd like to give you an eye picture of Harold Bonner's two speed set-up. He has a second escapement in the cabin of his ship. The escapement rotates a rod which runs into a K & B shutoff. The rod is fastened through a round plug which has a large and a small hole drilled through it. For high speed (a Citizens outfit is used) the escapement rotates the plug to the smaller hole through the shutoff which leans the engine out. For low speed, the larger hole is rotated into position which allows the engine to four cycle. The second escapement is actuated by rapidly pressing the transmitter button. The rudder naturally actuates rapidly also but his doesn't change the direction of flight. Two needle valves are used in conjunction with the shutoff to adjust for both low and high speeds. Bonner has been using an Arden *.19* with an extended venturi, making it possible to install the two needle valves. We watched some of his touch and go landings and the engine control worked to perfection.

Harold is quite a perfectionist and is always in there working out more simple accessories for model aircraft. Here's a fellow who will take the time to explain anything that he has on or in his ship. We've noticed that the R.C. flyers are always anxious to help the newer flyers. Don't be bashful fellows —step up and try your hand at Radio Control.

Rules must have enough breadth so that they don't dictate what equipment should be used. A.M.A. should be brought in and informed as soon as action starts. Top flyers like the Walkers and Trammels would still have the Open event. The flying rules should be re-written for the "standardized event." Such stuff as inverted flight, impossible maneuvers, balloon busting, and the like should be scratched. Reliability should be put high on the list. So should touch and go landings. This one maneuver alone will tend to counteract the too-close resemblance of radio control to free-flight. The time has come now to take the big question mark off the radio control event. Watch for a Goodyear R.C. event with three or four and maybe more ships in the air at the same time. Tuning would have to be sharp but with the bands of operation that are now in existence, it *(Continued on page 38)*


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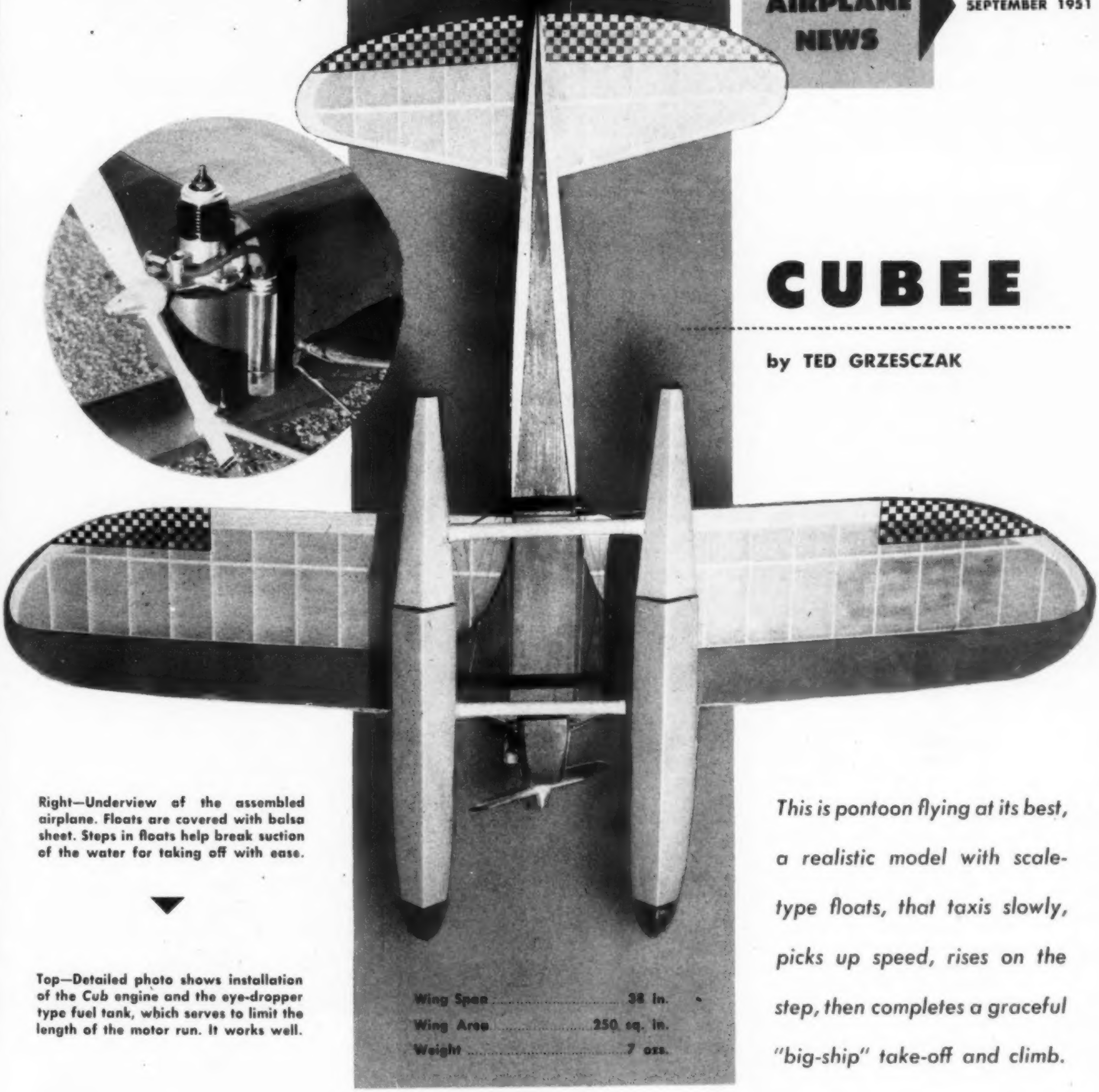


CUBEE

by TED GRZESCZAK

Right—Underview of the assembled airplane. Floats are covered with balsa sheet. Steps in floats help break suction of the water for taking off with ease.

Top—Detailed photo shows installation of the Cub engine and the eye-dropper type fuel tank, which serves to limit the length of the motor run. It works well.

This is pontoon flying at its best, a realistic model with scale-type floats, that taxis slowly, picks up speed, rises on the step, then completes a graceful "big-ship" take-off and climb.

Until you have seen a sport-type seaplane with its slim realistic floats skim along a glassy surface, then swoop gracefully into the air, you haven't seen anything. There is no greater thrill than to start that engine, set the plane on the water and watch the prop move the model slowly at first, but then faster and faster until it is planing along on the steps, finally to make a true rise-off-water (ROW) take-off.

Cubee is no contest model with ugly squat floats to get the machine quickly into the air. It is meant to look a little like a real airplane and to act exactly like the real thing. Take our word for it, the extra work in making those two genuine pontoons will be amply repaid.

But if you should want to convert *Cubee* into a land model (oh, no!), be sure to use only *.035-.039* engines as the ship will be too fast to fly on larger motors without floats, certainly so if an *.074* is used.

To build the fuselage, cut the sides from 1/16" sheet balsa and cement the rear together. Cut out the balsa bulkheads and cement them in place, checking both alignment and the joints. The plywood firewall must be cemented well because it has to take a great deal of punishment. Put the fuselage stringers in place, starting with the top one and working down. The cowl now can be carved to shape and cemented in place. The bottom is covered with 1/16" sheet balsa, the grain running the long way on the bottom, except where the wing passes through; here the grain is run crosswise. The dowls for holding the wing in place now are added.

The wire gear now is made and soldered together. This should be done carefully so that the gear is the same as the plan; this is important if the model is to take off. Bind and solder all joints well. Fine copper wire is good for binding. All joints should be clean, then soldering is a pleasure and not a nightmare.

The floats are easy to make by using a keel and sheet covering. Cut out the bulkheads and keels. Cement in place. When these frames are finished, sheet the bottoms.

Straight dihedral, the curved tips, and a bubble canopy, make *Cubee*—the plane on the cover—an unusually pretty project.

The cross bars now are added along with the tubing that holds them to the gear. The top is covered. Add the nose blocks and shape as shown on the plan. Sand smooth and cover floats with tissue. Dope and sand with fine sandpaper (6-0). Dope the floats five to eight time to assure water tightness.

The original model used an *.074 Cub* and a Maco clear tank, as this could serve as a timing device if the model was flown in a restricted area. The 7" plastic prop worked out well. The entire model is fuel proofed and trimmed to individual taste. Trim-film was used as it is easy to apply and saves weight and time.

The rudder is cut from 1/16" sheet balsa and sanded to shape. To start the stabilizer, cut the ribs and outline from balsa. Assemble over the plan. Be sure here that all the joints are well sanded as this will prevent warping later. Cover the stabilizer and cement in place. The rudder now can be cemented in place, checking to see that it is straight. Add the tail fairing blocks. These can be cut from soft balsa. The rest of the fuselage then can be covered. It is wise to cover the balsa parts as this will keep the dope from penetrating into the balsa and keep it on the surface where it will do the most good.

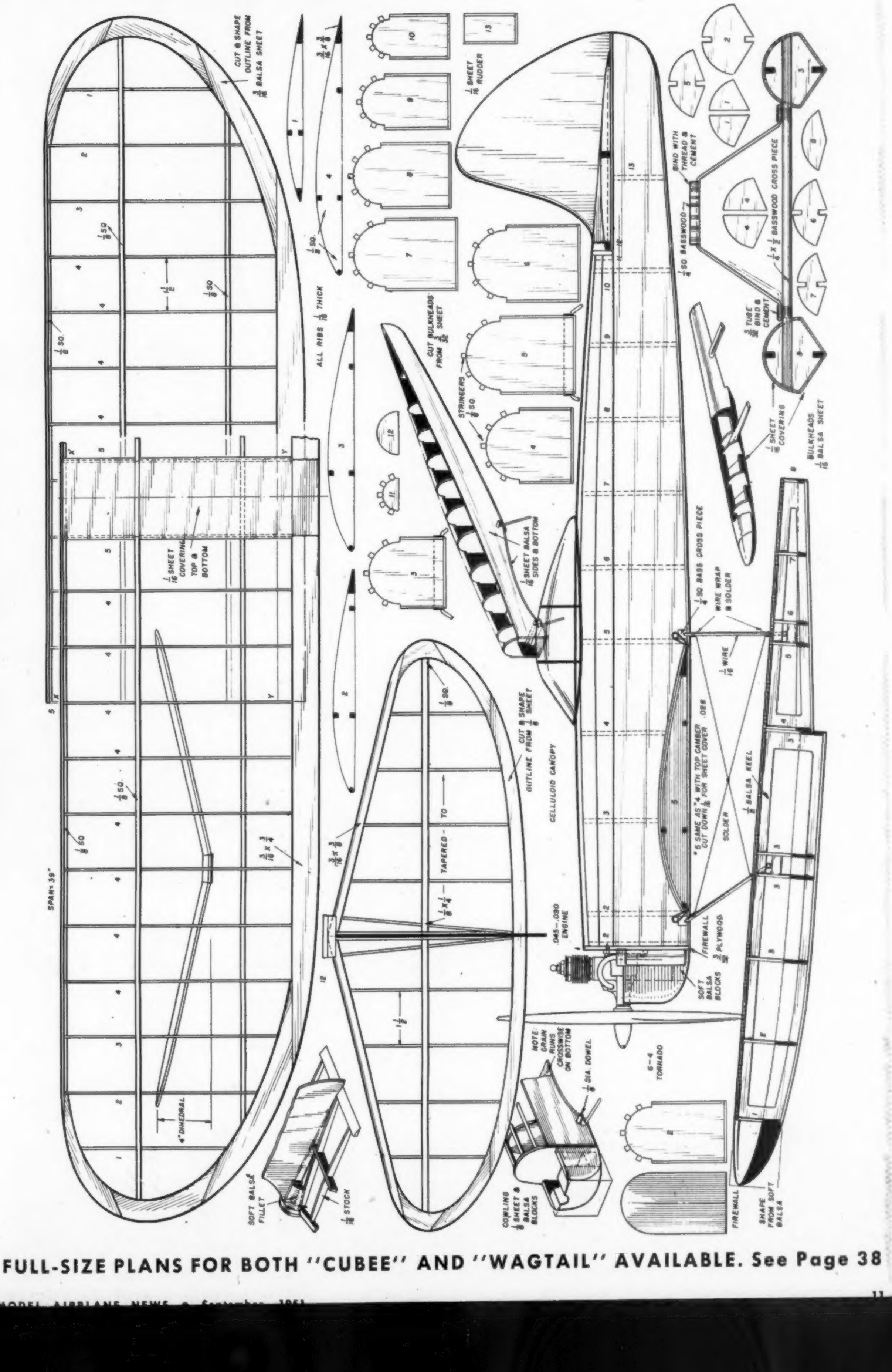
Cut wing ribs, wing tip outline, then assemble the wing panel over the plan. When the panel is dry, remove it, then the other panel can be built directly over the first panel; that is, the panel is turned over and built back to back. When these are dry, separate and join with the dihedral gussets; this gives the wing panels the necessary span to complete the wing and center section, which is flat where it will rest below the fuselage. Sheet cover this section when the wing halves are jointed.

We used tissue to cover the wing as well doped tissue is strong and will not pull the wing out of shape. Check to see that the wing is not warped as this will make the model hard to fly. These warps can be steamed out by holding the wing in the position wanted; place it in the path of the steam and when the paper is pliable, remove, holding until dry.

Glide the model over tall grass; the original model balanced perfectly. However, differences in wood may need some weight added here or there. When flying, make sure that the wing is on tight as this is one way to let the model crash if the wing should move about. It will crash a model faster than a warped wing or a rudder that isn't cemented on straight.

Set the model on the water. It should rest in a nose down position. Start the engine and give her a short run at slow speed. This will show if the floats are true. If the model turns to the right, lower the front of the left. This will straighten out this condition. When the model taxis straight, start the engine and launch. Watch how she flies after the take-off. If the model refuses to take-off but the floats tend to submerge, check the angle of the floats to the plan and bend the wire rear strut to raise the tail end of the plane higher and this will cure your trouble.

The one-piece wing slides under fuselage, is held in place by rubber bands over dowls. Structure thoroughly sealed and the plane consequently is fully waterproof.



FULL-SIZE PLANS FOR BOTH "CUBEE" AND "WAGTAIL" AVAILABLE. See Page 38

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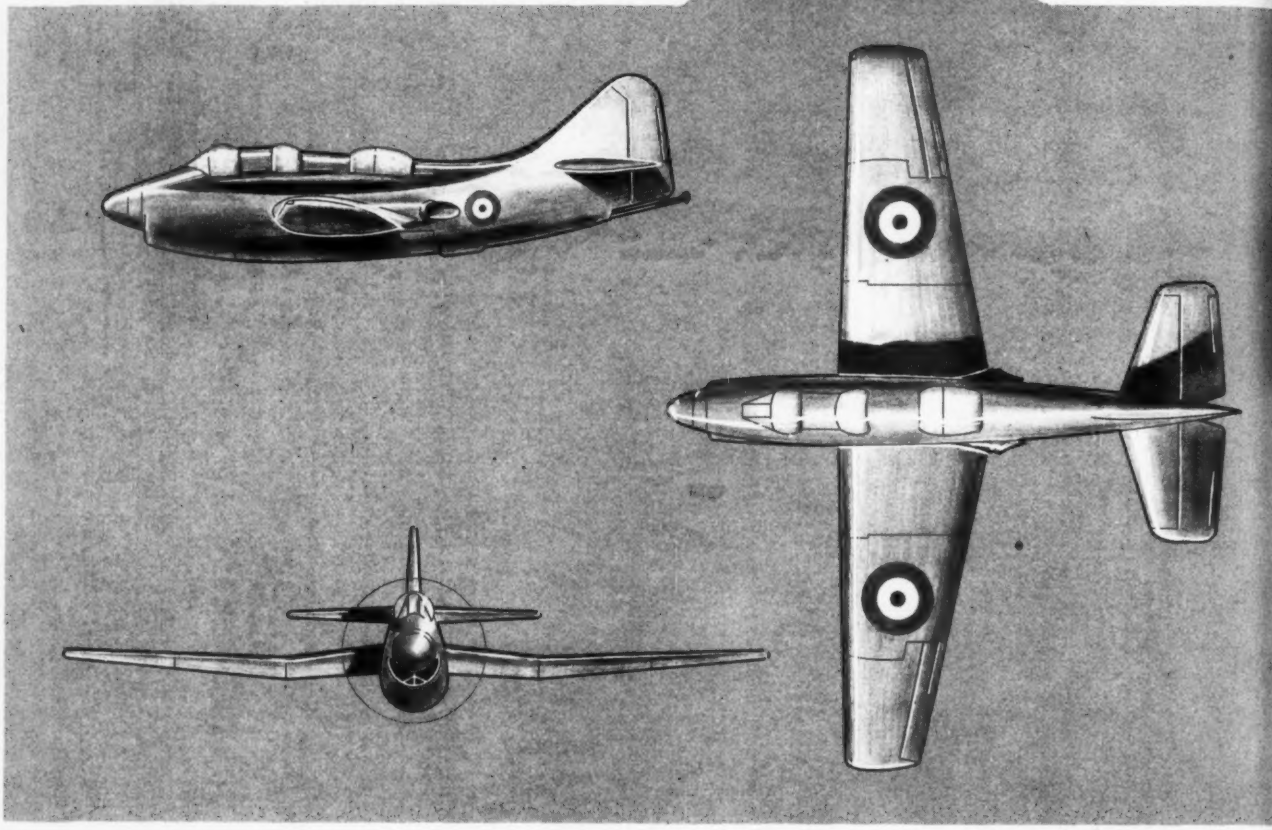

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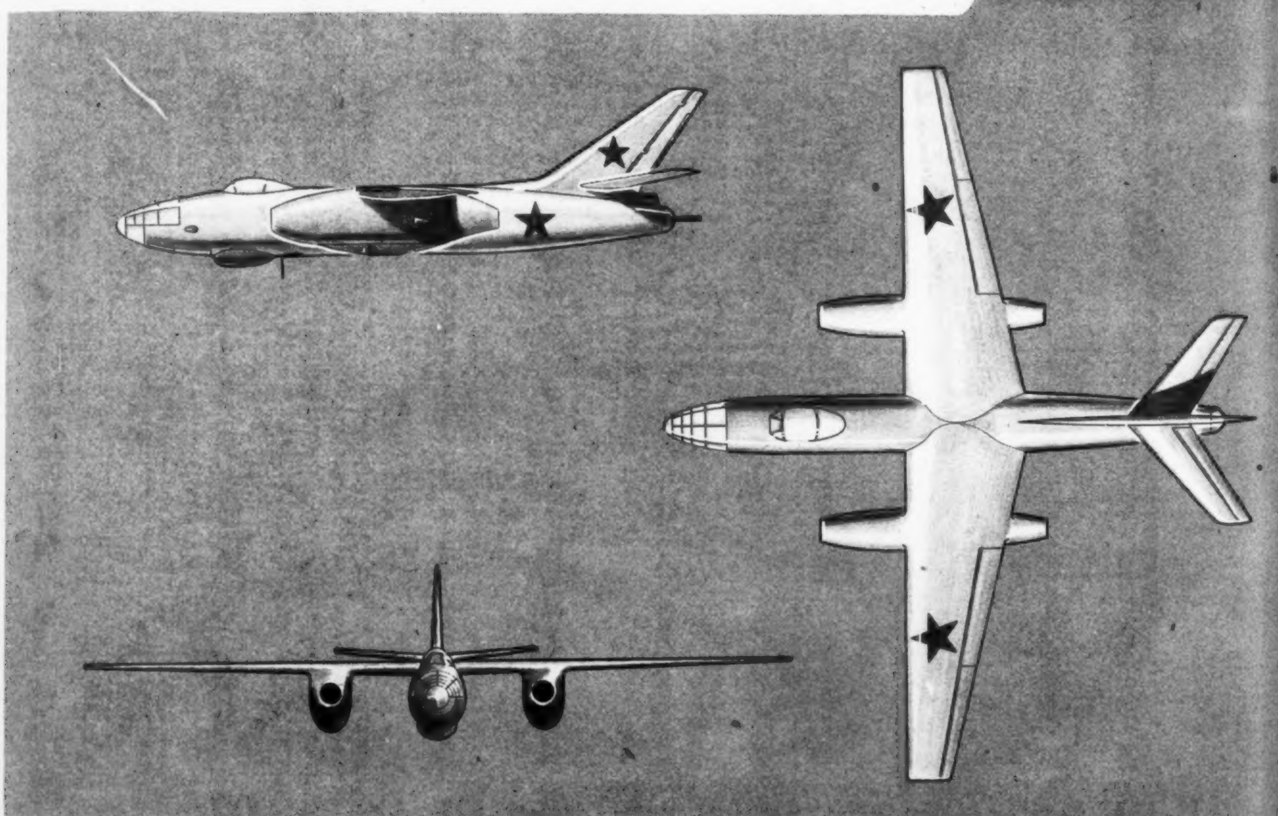
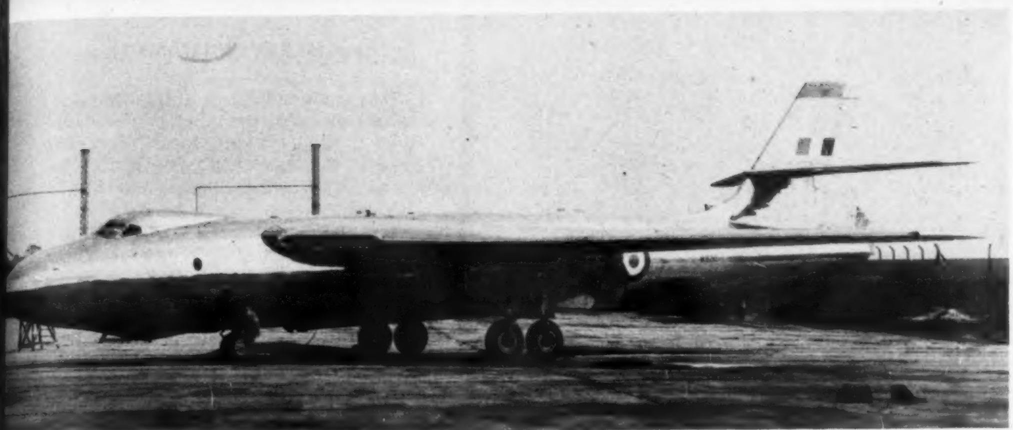




Four-Avon jet Vickers 660 have been ordered by the RAF to replace the Lincolns and B-29's in Bomber Command service.

planes in the *NEWS*

by DAVID ANDERTON

Two radically new airplanes make their debut this month. First, ordered into the factory straight off the drawing boards, is the

Bell X-5 required three years of research, development by the Air Force, the NACA, and Bell. In this photo the wings are in the rearward or high speed position. Move forward for the take-off.

Vickers 660, powerful, fast four-jet bomber for standard service in the RAF. Second, is the Bell X-5, a jet research job that can vary its sweepback either on the ground or while in full flight.

Interesting profile of the X-5 permits installation of an axial flow 4,900 lbs. thrust Allison J-35-A-17 turbine in belly. Dive brakes near nose. Messerschmitt had similar proposal during war.

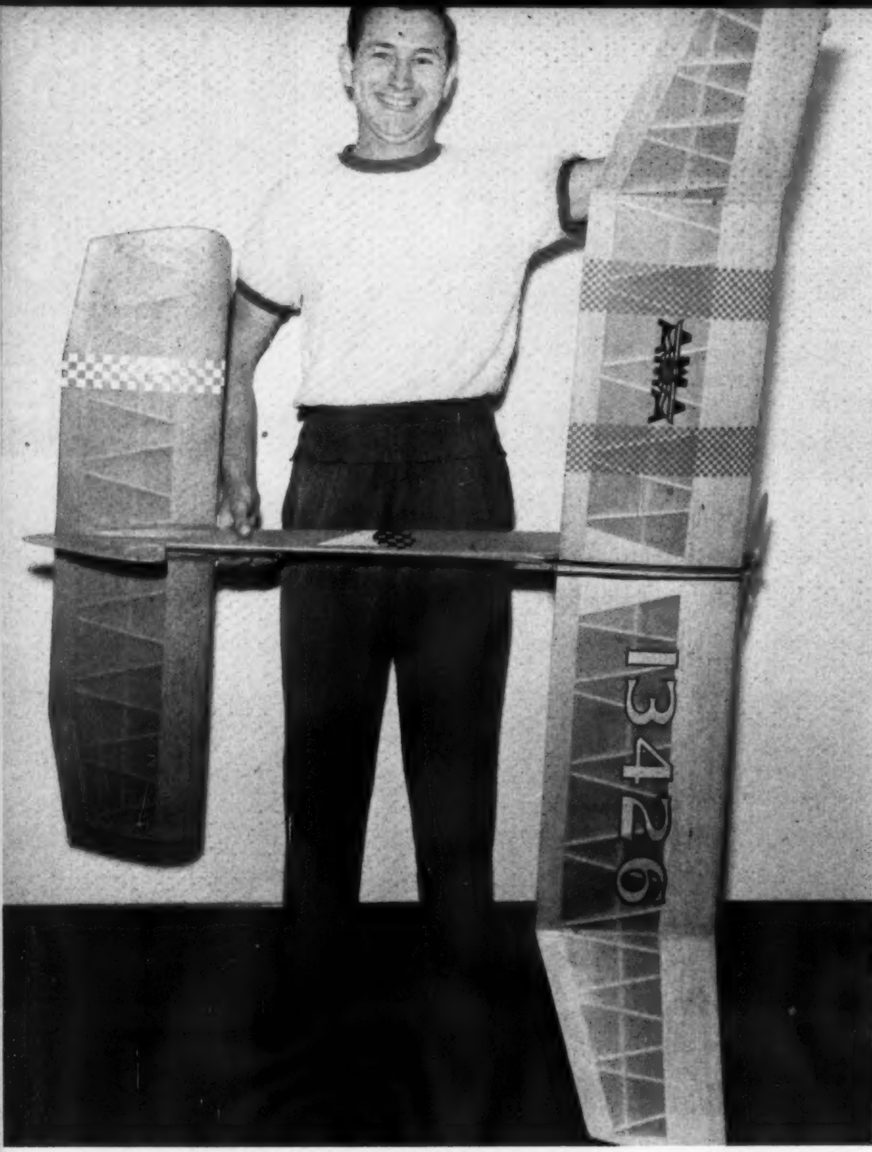
The story of aviation is the story of research—in engines, aerodynamics and structures. Part and parcel of the entire research picture are the research planes, instrument-laden beasts of burden that plod through the skies in endless search of data. Some were intended to slam through sonic speed; some to measure air loads in flight. And then there is the Bell *X-5*, the only one of its kind.

Latest of Uncle Sam's research craft, the *X-5* has spread its wings for take-off on a series of flight tests. And that sentence is literally true, because the *X-5* is built with a wing whose angle of sweepback can be changed in flight and on the ground. Turbojet powered, the *X-5* takes off with its wings spread to their furthest forward position. Once airborne and at the test altitude, the wings are swung back to the desired angle of sweep and tests are run.

It took three years of research and development by the Air Force, the National Advisory Committee for Aeronautics and Bell Aircraft Corp. to come up with *X-5* design. But they have received a healthy assist from Willy Messerschmitt who submitted a design project, the *P.1101*, to the German Air Ministry a few months before the surrender in Europe. In layout, the Bell *X-5* is a ringer for the *P.1101*.

The *P.1101*, according to Herr W. Voigt, Messerschmitt's chief of the advanced design office, was based on the personal wish of Willy M. to have a flight-test airplane for the collection of high-speed data. One prototype *P.1101* was completed, but was blown up before the Allied troops arrived. However, the technical missions which followed on the heels of the troops did find drawings and data for this and other designs. And the civilian technical head of the mission which conducted a most thorough investigation of the entire Messerschmitt organization was Robert J. Woods, of Bell Aircraft. So much for the German influence.

The design of the mechanism for changing the sweep of the wing in flight was a major achievement on the part of the Bell engineers. Not only must the wing be moved against loads, but the surfaces must continue to be smoothly (*Continued on page* 50)



This is *Sandy Hogan* constructed and flown by the author. It was not a specially selected kit.

we test ▶ the sandy hogan

Another in a series of impartial reports based on the building and flying of "name" kits. Valuable tips for free-flight models in general are included. Sandy Hogan 70 is for Classes B and C.

by HARRY WILLIAMSON

▶ In keeping with their announced policy of producing the finest contest winning designs in kit form, Berkeley Models, Inc. have just come forth with their version of Denny Davis' *Sandy Hogan.*

The original has won a very impressive number of places, especially in West coast competition, and now, through Berkeley's efforts, may become a leading contender for top hardware throughout the country. The Sandy Hogan is fairly typical of current western free flight trends, with low wing loading, large stab, and simplified design.

Opening the box reveals a number of sheets of die-cut balsa and plywood parts. In addition to the die-cutting, the balsa parts are die-stamped to aid in identification. A large quantity of the various size balsa sheets required on the lifting surfaces and fuselage, plus pre-shaped leading edges, and a copious supply of strips make up a good-sized bundle of lumber.

The landing gear of 1/8" diameter wire is preformed. There is a small envelope, containing a hard, hubless, solid-rubber wheel; several small brass eyelets; and an assortment of screws for engine mounting and rudder tab. Three sheets of heavy, white *Silkspan* about 24" x 30" in size are included, plus a single drawing by Henry Struck measuring 33" x 43". After a careful study of the drawings, a good habit to form, we went to work.

The fuselage, which fairs from a rectangular section at the nose to a triangular section from the rear of the pylon aft, is begun by building a crutch directly over the top view on the drawing. Although the material supplied for the longerons was approximately 1" too short in this one kit, it was possible, with judicious use of the sanding block to fair the longerons, after assembly, with the trailing edge of the rudder, without any loss in structural strength. The front crosspiece in the crutch is offset to allow for the three degrees right thrust indicated.

The vertical backbone sub-assembly is constructed over the side view of the fuselage and includes the top and rear of the pylon. Going back to the crutch, we sanded the formers to size and inserted them in the proper places between the longerons. The vertical backbone was cemented in place while the crutch was still pinned over the drawings and carefully aligned with the aid of a square and a ruler. Alignment is important because the pylon is a part of this assembly.

The fuselage framework was completed by adding two curved, die-cut strips from the nose to the rear of the pylon and the balsa uprights from that point to the leading edge of the stab. The stabilizer rests on top of the crutch and slips through an opening in the fuselage. The two sides of the crutch are not glued together at the

rear until the rudder is fitted in place. Once the tank was installed, the nose was filled in with scrap as indicated.

Two pieces of 1/8" die-cut plywood make up the firewall assembly. Three holes are provided in the front portion to accommodate K & B *29's* and *32's*. Engines other than these, when radially mounted, will have to be fitted to the firewall and the mounting holes drilled accordingly. We used a *Torp* in the test model, thereby eliminating this operation. The front portion of the firewall also has a right angled slot to accommodate the landing gear. This permits the gear to rest against the rear portion of the firewall while remaining flush with the front, which simplifies engine installation.

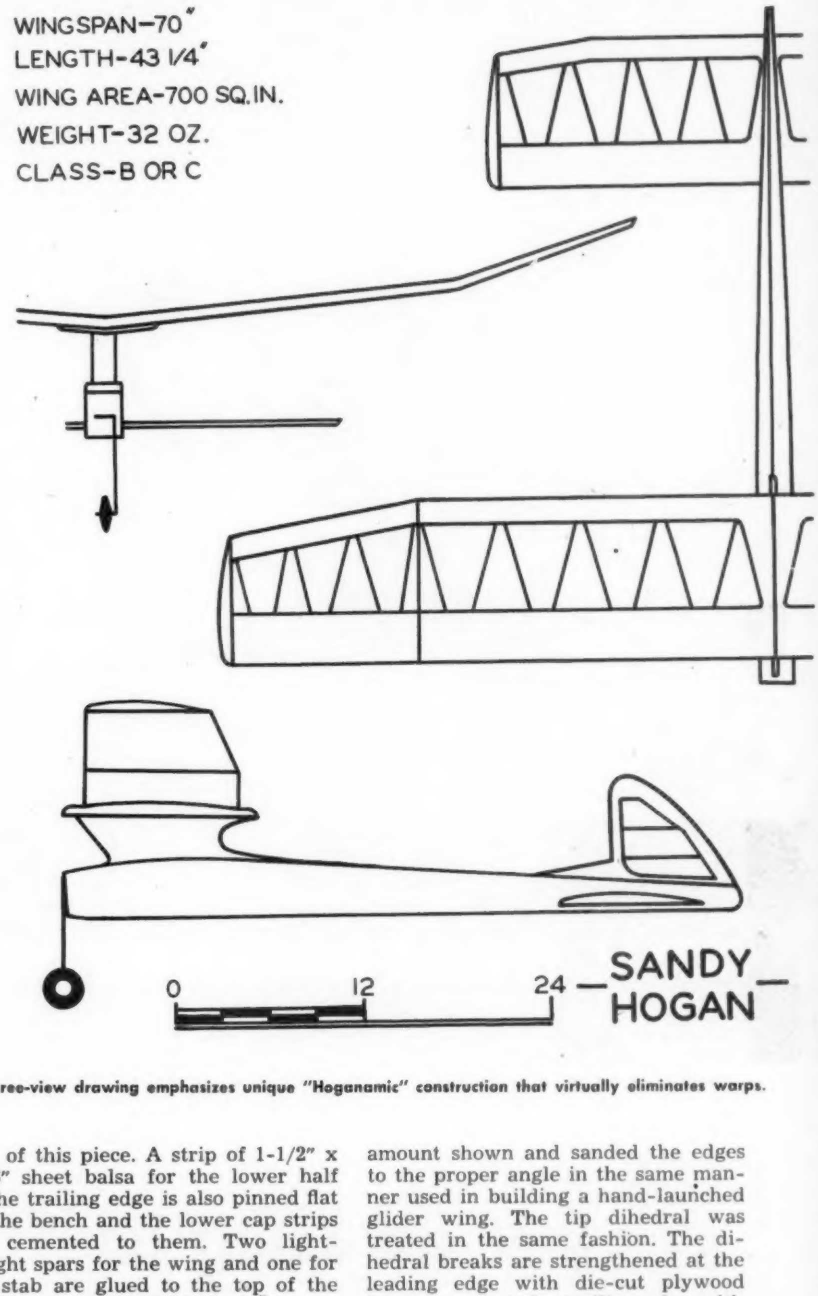
Three number 4-40 x 1-1/2" long steel mounting bolts are supplied in the kit to replace the regular crankcase bolts. Forming staples from some 1/32" diameter wire and soldering them in the screw slot as suggested on the plans effectively holds them in place after they are fed through the firewall from the rear. We added brass washer to each bolt, under the head, to prevent the plywood from being compressed when the engine is tightened down. Before cementing the firewall to the fuselage, the engine was slipped over the mounting bolts and securely fastened while the mounting bolts were glued in place.

Since the landing gear and the engine are both mounted on the firewall, this unit takes a beating on hard landings. We elected to cover the firewall with aircraft fabric and extended it around, about 1" on all sides, instead of using the two strips of pinked aircraft tape shown on the drawing.

Soft sheet balsa, 1/16" thick, is used to cover the fuselage framework and pylon. An opening was left in the bottom for the recommended parachute dethermalizer and the entire structure covered with heavy *Silkspan*. An Anderson *Baby Spitfire* timer valve was located in the nose by cutting a hole through the left side of the fuselage at the rear of the tank.

The drawings show a chute dethermalizer operated by an Austin timer. The chute is contained in a compartment under the pylon, with a die-cut, plywood trap door holding it in place. Installation of the timer as shown on the plans, gave us some trouble, trying to bend the internal release wire. So, using the old army wheeze of "when in doubt, attack," we built an external release wire which extends from the timer shaft around to the bottom of the fuselage. A 19" square chute was made from nylon and fastened to a die-cut hole in the trapdoor with a 6' lead.

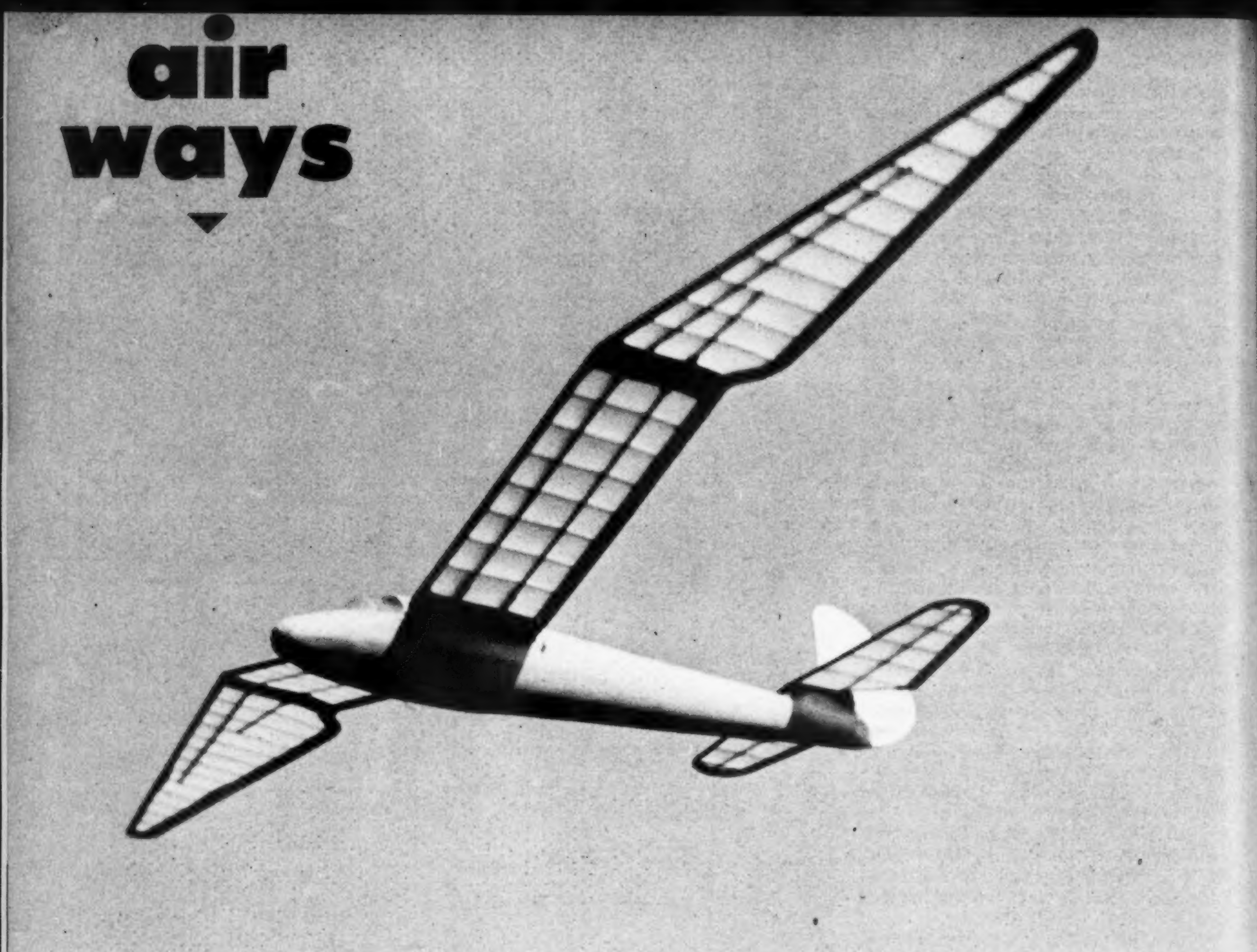
The wing and stabilizer, featuring "Hoganamic" construction, proved to be interesting. Because of the flat-bottomed airfoil sections, assembly of these surfaces is begun by pinning down the heavy, pre-shaped leading edges, and cementing a piece of 1/16" x 1/2" sheet balsa to the rear and bottom of this piece. A strip of 1-1/2" x 1/16" sheet balsa for the lower half of the trailing edge is also pinned flat on the bench and the lower cap strips are cemented to them. Two lightweight spars for the wing and one for the stab are glued to the top of the cap strips, after which the ribs are positioned and also cemented to these pieces. With this type of construction, using a two-piece leading edge, the die-cut ribs may, if too short, be readily shimmed-up by inserting a scrap-balsa wedge between them and the leading edge. After allowing sufficient drying time, the top spars and top half of the trailing edges were added. Because of its size, only the left half of the wing is shown on the drawings, making it necessary to oil the plans and reverse them when constructing the right wing panel.



Three-view drawing emphasizes unique "Hoganamic" construction that virtually eliminates warps.

When both panels were ready, we made the center dihedral break first, by blocking up the tips to the correct amount shown and sanded the edges to the proper angle in the same manner used in building a hand-launched glider wing. The tip dihedral was treated in the same fashion. The dihedral breaks are strengthened at the leading edge with die-cut plywood formers and at the trailing edge with gauze or aircraft tape. Die-cut balsa tips are glued to the end ribs of both the wing and stab and are upswept for the wing as shown in detail and presumably also for the stabilizer. Die-cut balsa false ribs are utilized in the wing on the inboard panels only. The upper portion of the wing and stab, from the front spar to the leading edge is covered with sheet balsa. This material should be equal in hardness and density to prevent warps and eliminate later unbalance of the wing. Top cap strips run from the leading edge sheet to the trailing edge sheet and are *(Continued on page 54)*

air ways



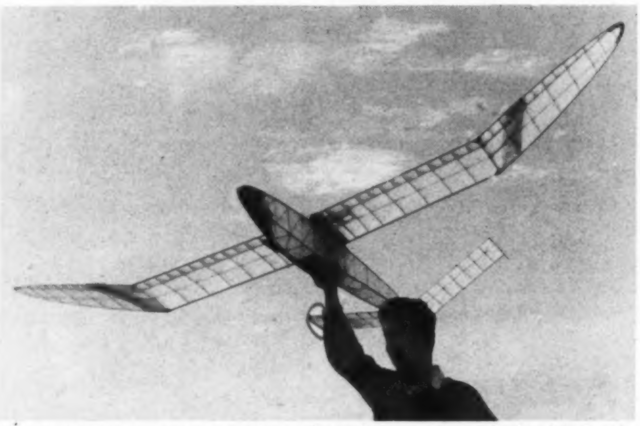
No heavier-than-air-machine ever surpassed the beauty of the German *Minimoa* sailplane. Six-foot flier was built by Warren Watson, Baldwin Park, Calif.

Outstanding models built by readers in many lands. Can you win one of the prizes?

Ten dollar prize winner is this incredibly detailed Curtis *P-6E* from a Cleveland kit by Robert Beach, Rochester, N Y. Required 18 months to build and features such items as controllable-stab from cockpit, shock-absorbing landing gear and tail wheel, complete cockpit layout and an electric motor.

Second place subscription winner is this Martin *B-26 Marauder*, another Cleveland kit, by Larry Dunham, Baltimore. Two Fox *35's*, planked, and weighs 4-1/2 lbs.

Modified *Liftmaster*, Fred Ulrich, Boise, Idaho, is third-place subscription winner. Silk-covered, *Baby Mac* powered, has made more than 100 flights.



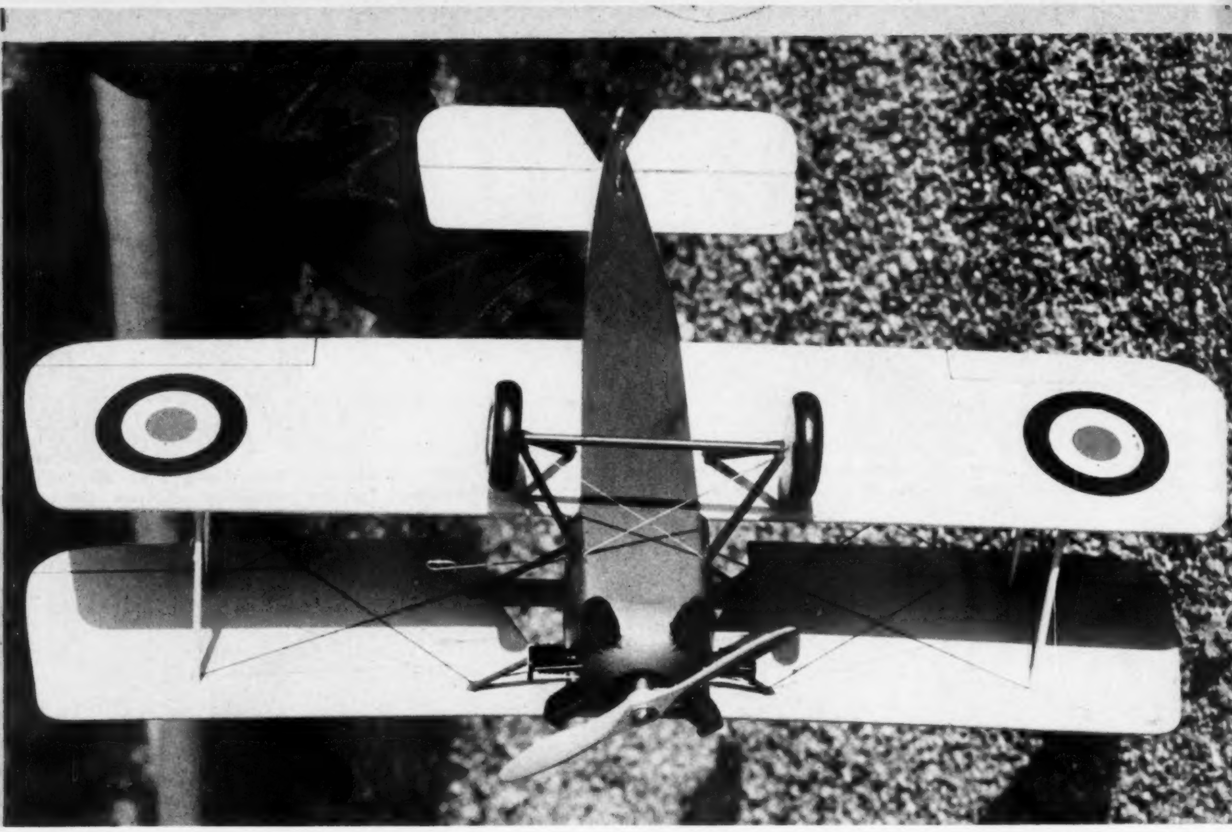
Even in Japan you can win a Plymouth trophy, says Ayma Kudo, Tokyo, who did so with this 110 in. monster sailplane which set Japanese record of 12:23.

Cyril Shaw, well-known British model builder worked up this realistic sport type free flight Diesel-powered job. Large spinner is a pleasing touch.

Novel stunter by B. W. Robbins, Midway Park, N. C., has thrust-line one inch to port, eliminating rudder offset. Span 52 in. McCoy 60 runs well on side.

An enclosed jet Lockheed *P-80* flying model, made in Japan, by the Ogawa Model Co., makers of model engines. Heat is problem on any enclosed installation.

This eight-foot sailplane proved a fine flier for Elbert McEwen, Nashville, Tenn., its builder.

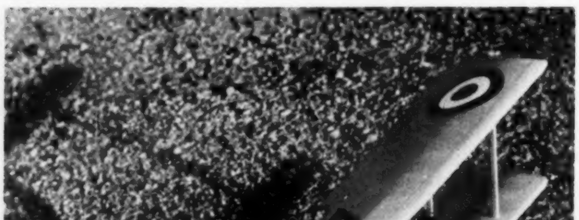


Square fuselage, faired on top, and straight-edged wings make this one biplane that is easy to assemble. Generous wing area for the stunt addicts.

Wagtail

Flying-scale fans get a break with this model of a beautiful World War I type fighter.

by PAUL J. PALANEK



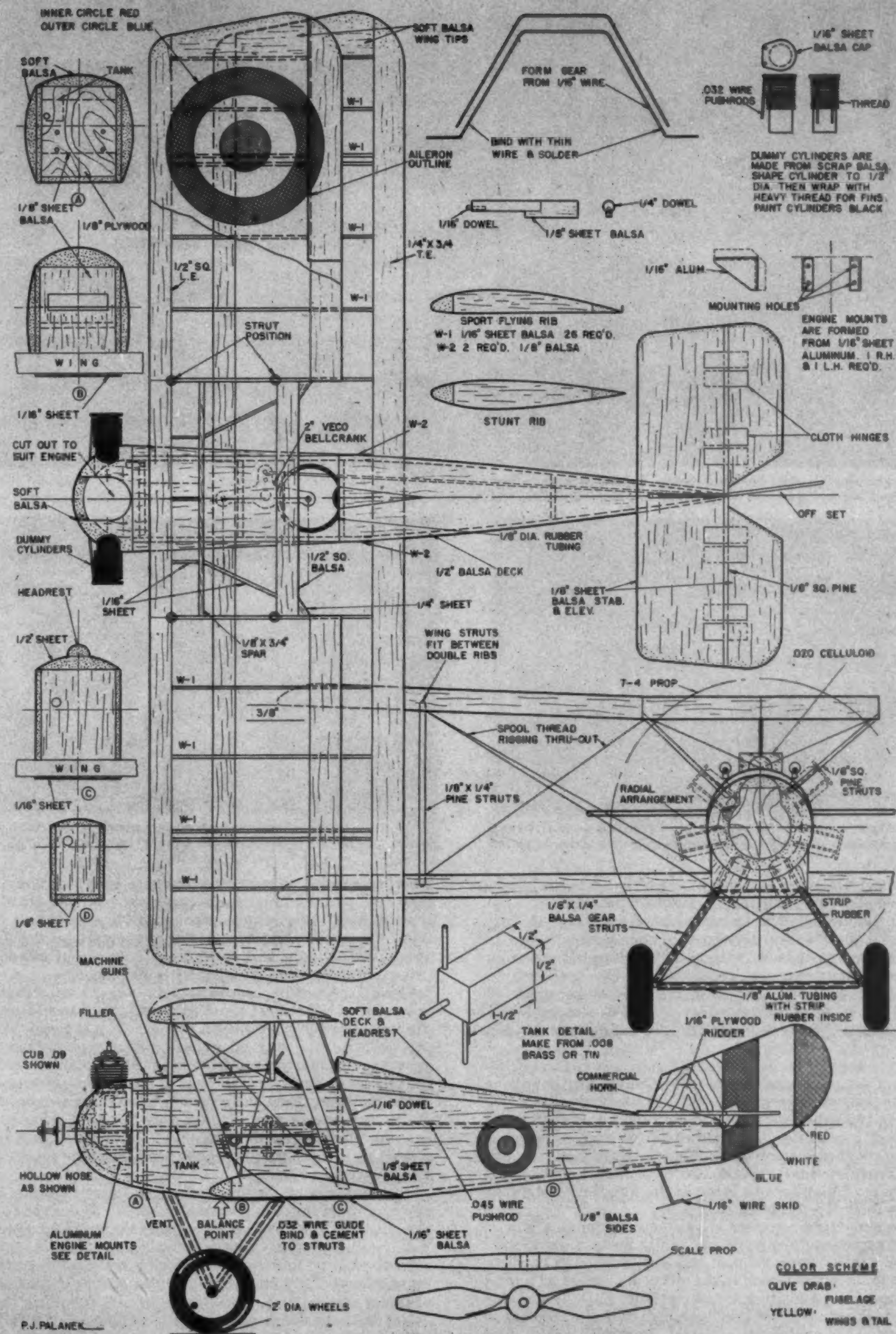
The Cub engine blends in nicely with the dummy cylinders and is accessible. Center section cutout was an odd feature of the real plane.

The *Wagtail* was designed as a fast, quick climbing, high-altitude fighter. It was the first World War I airplane to use a fixed radial engine for power. This engine was an A. B. C. *Wasp* 170 hp. Top speed was 125 mph at 10,000 feet, landing speed in the neighborhood of 45 to 50 mph.

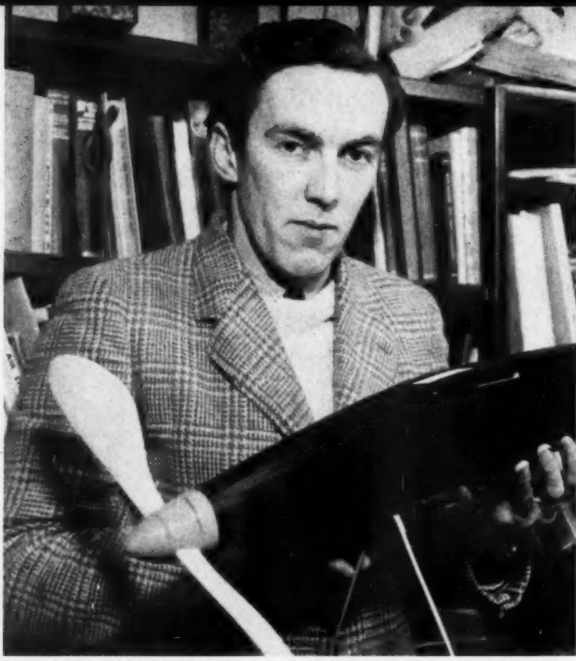
The pilot's visibility was excellent, for more than half the center section was left open. The wings were of equal span with the upper surface carrying a dihedral angle of five degrees, the lower surface having none. The *Wagtail* sported two machine guns synchronized to fire through the spinning prop.

Modeling this famous airplane should meet with little or no difficulty. The fuselage is box shape; the tail surfaces are sheet halves and plywood. The wings are simple since both surfaces are built in one piece. Using a medium grade of balsa throughout the project proved very satisfactory.

The fuselage sides are shaped from 1/8" sheet balsa. In shaping the sides, incorporate the cut-out for the lower wing panel. The fuselage formers B,C,D, are cut from 1/8" sheet balsa. Former A is cut from 1/8" plywood. To save time and energy make all the cut-outs including round and square holes as shown. Formers A,B,C, are cemented in place and when dried draw the tail end together, cement well. Add former D. The bellcrank platform is cut from 1/8" hard sheet balsa and placed in the positon shown. Above the platform cement a 1/2" x 1" x 1-1/2" balsa block, through which the 2" Veco bellcrank is bolted. The lower portion of the fuselage is now added, being fitted between the fuselage sides. (*Continued on page* 38)



FULL-SIZE PLANS FOR BOTH "CUBEE" AND "WAGTAIL" AVAILABLE. **See Page 38**

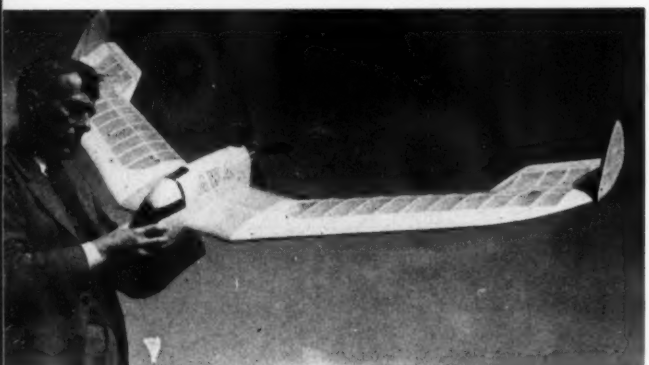


The author, holding his 1951 Wakefield design. Warring was a member of both the 1949 and the 1950 Wakefield teams from Great Britain.

the European angle

by RON WARRING

Concluding his round-up of foreign trends in design, one of Britain's outstanding modelers outlines the specs of many history-making ships in England and on the Continent.



Tailless designs have not been neglected. In England there is an annual tailless competition, although it has not been very widely supported.

A. A. Judge starts off this attractive streamliner in the Astral Cup contest. Motors no larger than 2.5 cc. (.15) comprise 90% of total.

Unlike rubber, the F.A.I. glider model has become popular, especially since the introduction of the Swedish Cup for an International class known as the Nordic or A-2. This is an F.A.I. specification abridged to make processing easy. Size limits are given with minimum fuselage cross section and fixed minimum weight requirements. The specification is: *Nordic A-2.* Wing plus stabilizer area to be between 495 and 526 sq. in. Minimum total weight 14.46 ounces. Minimum fuselage cross section equals total lifting area divided by 100.

This produces a model of around five foot span and the variety of design is considerable. The Continental countries have had previous experience with F.A.I. models of this size and some typical layouts are shown in Fig. 9. British modelers got down to their first Nordics in 1950 and the one outstanding example is shown in Fig. 10. Unfortunately designer Yeabsley did not make the '50 British Nordic team; yet outside of that he won three of the five National glider contests he entered during that year.

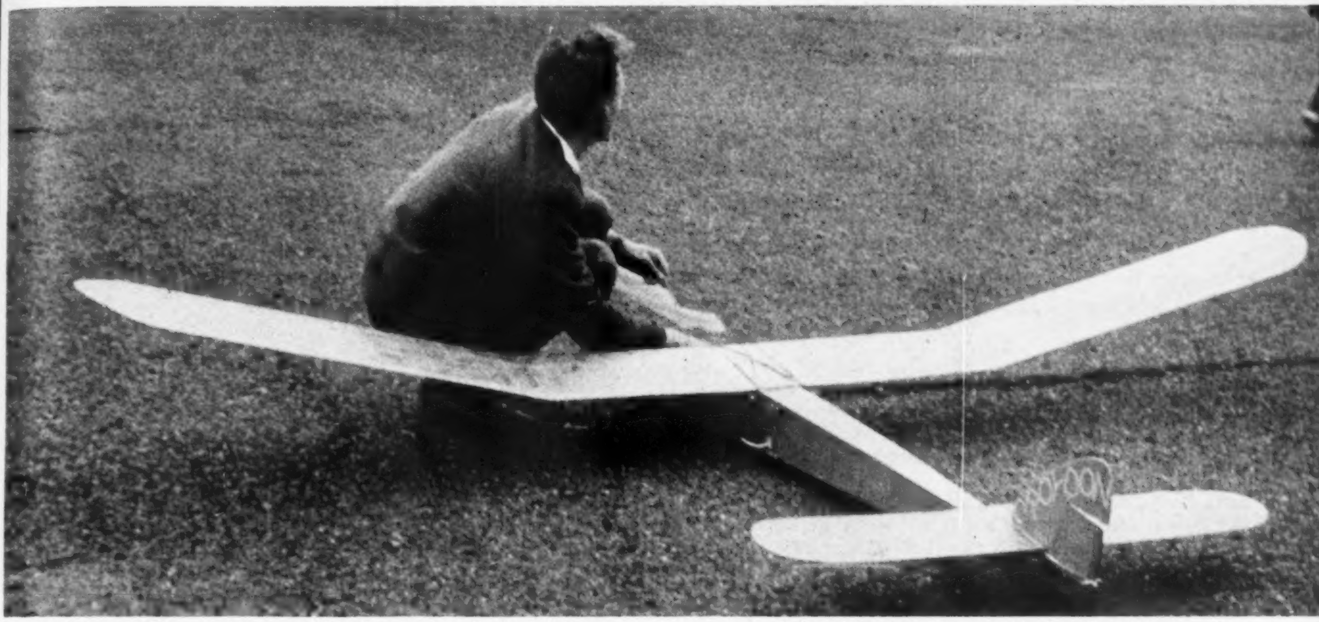
For a non-Nordic contest, however, the giant glider is much favored—and by giant we really mean a big model!

Roy Yeabsley again showed the way, with a 10 ft. span, 1228 sq. in. area job which could either be loaded as a light weight or to F.A.I. loading. Characteristic of all the successful giants is a simple slabsided fuselage with parallel chord wings and, generally, tip dihedral. Portability is a vital problem (and the cost of materials and time spent on building!); otherwise more of these models would be flown, for they are virtually unbeatable under the right conditions. A typical design of this type is shown in Fig. 12. Apart from this extreme, the trend in all lightweight glider designs is now towards more and more wing area, about 400 sq. in. being considered the satisfactory minimum.

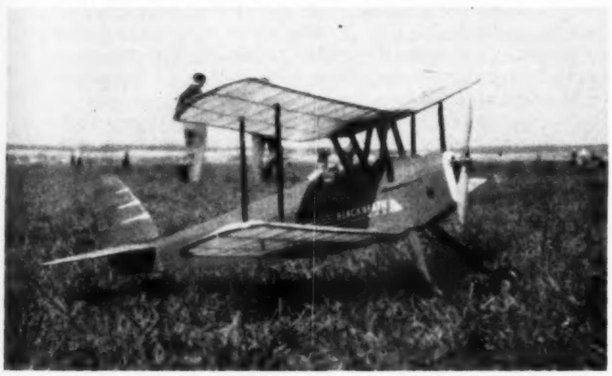
Finally, returning to gas models once more, American influence is here most marked throughout the European countries. As far as Britain is concerned, it is fairly true to say that the majority of contest models are either stock American design (kit model or magazine plan) or based on the typical pylon layout. In view of the considerable success of the *Banshee*, there was a period when design-derivatives of this type were commonplace. Now that period has passed and the standard pylon design, if that term can be employed, is rather the functional, slim-fuselage model with straight-tapered wings.

The majority of British commercial motors are diesels, and largely in the smaller sizes. Probably 90 per cent of the market is covered by motors no larger than 2.5 cc. A recent F.A.I. ruling that all future international (F.A.I.) power contests will be limited to a motor capacity of 2.5 cc maximum (about .15 cu. in.) simply confirms the popular choice of motor size.

Not that the large gas model is neglected! There have been quite a number produced—again mostly American designs—and largely powered by American motors. Gas



Yeabsley's towliner, the *Sun-Bug*. With 10 ft. span, it can be loaded either to F.A.I. rules or as a light weight. Slab sides, parallel edges. Portability is main problem. That and the construction keep more from being built, as these giants are unbeatable under good conditions. Excessive cost is a factor, too.



The Bowden Trophy, encouraging precision flying, has brought forth many odd gas models like this biplane, that stress realism in their design.

Reminiscent of Comet *Clipper* is this Dutch design which doubles as duration, precision flying events. Europe not as thermal conscious as U. S.

competitions are currently to F.A.I. specification, where the wing loading is ridiculously low and with unrestricted power loading, and apart from the purely international events, all three classes, A, B and C, compete as one. Modelers have found that under these circumstances the small model stands an equal or better chance, besides being cheaper and quicker to build, more readily portable and, last but not least, relatively more sturdy.

Gas duration competition interest has largely suffered from the fact that National comps have been few in number and with little or no international flavor. For example, 1951 is the first time that a real European international contest has been scheduled. This will be held in Paris. Hitherto, the Wakefield, and more recently the Nordic associated with it, have stolen all the glamor.

The most successful British gas duration models of 1950 were based around the 2.5 cc motor — diesel in preference to glow plug. Typical overall figures would then be: Wing area 400-450 sq. in.; Total weight 12-14 oz.; Tailplane area 35-40%; NACA 6409 airfoil at +4, 5°; C.A. at 70% chord; thin Clark Y line at +1-1/2, 2°. Design layout is very much on current American lines.

There is another point to bear in mind regarding the actual timing of duration contests. Some are run on duration with a fixed motor run (nominally 20 seconds maximum, although this is often reduced to 15 or even ten seconds at centralized contests if there is considerable drift. F.A.I. rules, incidentally, allow a maximum of 30 seconds motor run, for record attempts). The other type of contest is for flight ratio. Total flight time is divided by length of motor run to give a ratio figure, with a minimum of 10 seconds recorded for motor run. Thus any motor run under ten seconds counts as ten seconds. With a maximum flight time of five minutes standard for all contests (rubber and glider as well) maximum possible ratio for any one flight is 30:1. The best models of this type generally average around 16:1 ratio, although 30:1 ratios are not uncommon under thermal conditions.

The best model for ratio contests is not necessarily the best for plain duration work. The former job has to get up high — fast. The latter can take more time about getting upstairs with a longer motor run allowed, provided the glide is good. Generally the small models score in the ratio events.

This ratio method is Continental in origin. Most of the European countries seem to favor it. In Britain, opinion is about equally divided. One of the main objections is recording and working out ratio results. You can get different results depending on how you work out a three-flight average!

Since the average run of British gas model is of the pylon type and similar to contemporary American practice—and that also goes for most of the other European models, as well—we will only describe two, Figs. 13 and 14. The for-

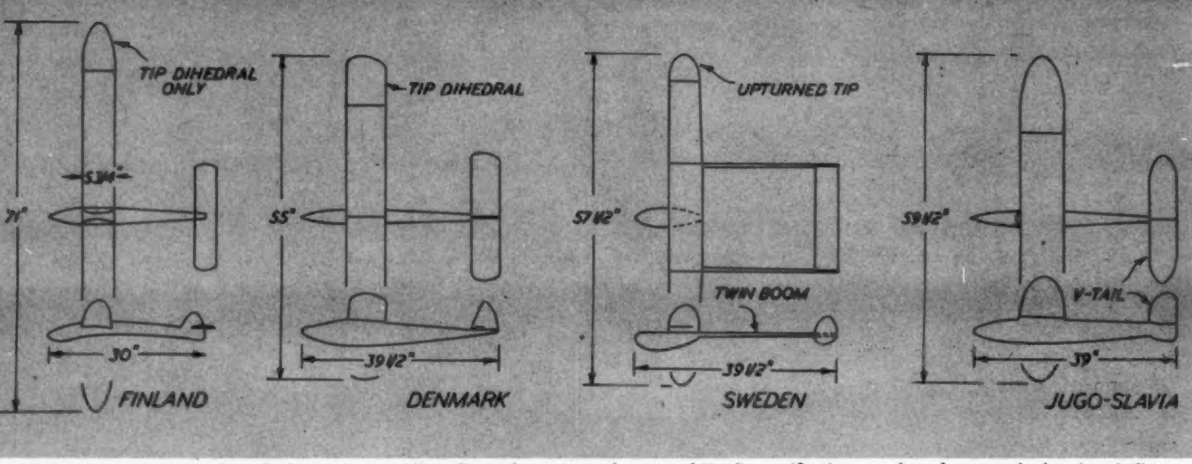


Fig. 9—Continental countries have had experience with towliners that answer the general Nordic specifications, as these four sample drawings indicate.

mer is typical of the best of the small models—rugged little jobs that can stand a spin-in and be flying again in a matter of minutes. Most of the small diesels, too, use plastic props which are just about unbreakable. They simply flex if they hit anything, a feature which the control line boys have probably appreciated more than the free-flighters!

The other is an interesting example of an unorthodox design, but a successful one. This layout has been developed by the Low Speed Aerodynamics Research Association, a working society of the more scientifically minded model aircraft enthusiasts. Features of their high-climbing gas model are a swept-forward wing, very low structural weight and small model size for the power employed. Measured rates of climb of up to 5,000 feet per minute have been obtained. Perhaps because of its unorthodox appearance few other modelers have attempted to duplicate the layout for contest work and so what could possibly be a high-time model is relatively untested in actual competition.

Basic theory behind the design is that the climb is achieved with propeller thrust. The wings are there of necessity to give a glide and their drag is cut to a minimum by using a very thin airfoil section. Small area (again for low drag), compatible with a good glide wing-loading figure, is given by low structural weight. The unorthodox configuration is to get the stability required for such a climb.

About the only interesting departure from orthodoxy in the gas model duration field apart from this is the shoulder-wing layout developed by the Belgians and to a lesser extent Italy and France — Fig. 15. An exaggerated downthrust angle is necessary to stabilize models of this type under power which, again with the low loading allowed under F.A.I. rules, have an astounding rate of climb and a good, floating glide. Wings in many instances are wire-braced. Some of the French and Italian designs are also of the shoulder-wing type without the exaggerated downthrust, but the trimming on these is very much more critical.

Besides pure duration work, however, there are other types of competition for gas models under the heading Precision where the emphasis is on controlled performance rather than sustained flight. Britain and Italy, to name two countries, have a certain popular following for precision events of this nature, but the numbers attracted have never been considerable.

Probably one of the main difficulties is that a precision flight schedule which, on paper, seems to award points fairly and accurately for take-off characteristics, general flight stability in climb and turns, good landings and landing within a specified flight time, can be rendered meaningless by a high wind or poor airfield conditions and the whole contest can turn into little more than a farce. This, in fact, has been the general attitude of leading contest fliers towards such events as the Bowden International, with its very complicated set of rules. These, for example, called for the model to take off entirely unassisted, fly for not less than 40 seconds but not more than 60 seconds, and make a good landing without damage. Points were awarded or deducted for the quality of the flight, overall appearance, lack of damage, and so on. More often than not it resolved into a matter of who could make flights of between 40 and 60 seconds under the conditions prevailing!

Long dissatisfied with the original Bowden rules, which could never be modified fast enough to keep up with all the

Fig. 10—Wing plus stab must stay 495, 526 sq. in. Yeabsley's Nordic.

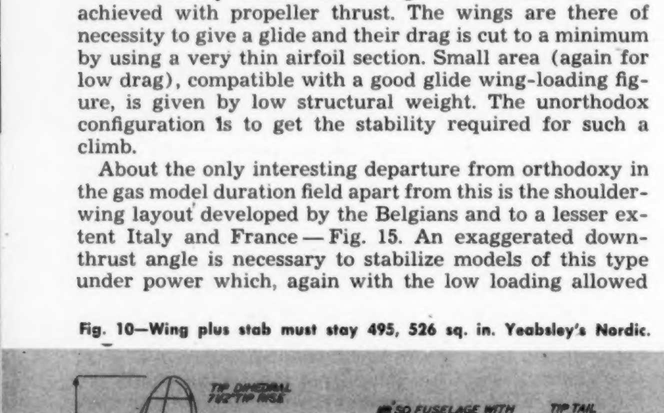
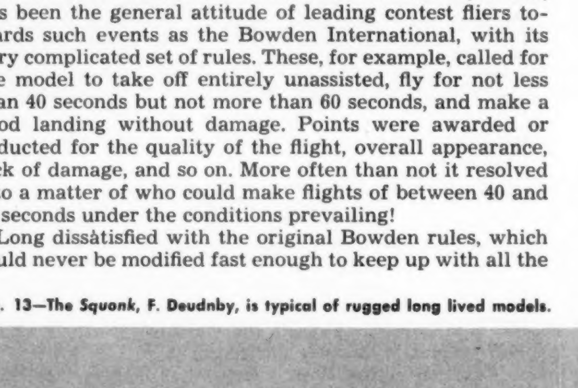


Fig. 13—The Squonk, F. Deudnby, is typical of rugged long lived models.



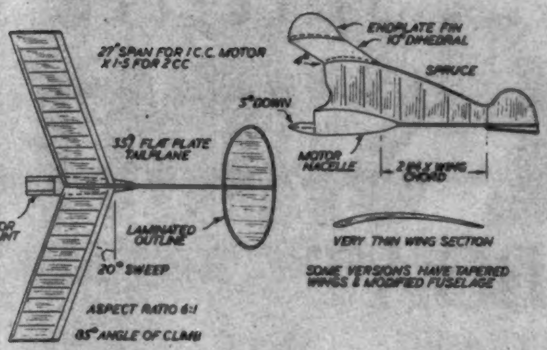


Fig. 14—Experiment by R. Annenberg has checked climb, 5,000 ft. min.

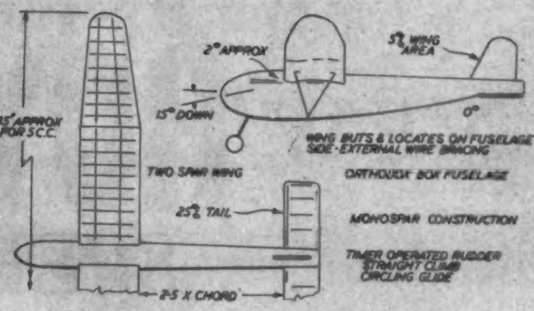


Fig. 15—Belgian layout featuring great downthrust is widely copied.

possible snags that showed up year by year, the '51 Bowden is being devoted to a payload contest with an almost identical specification to the American Class A PAA-load event. It is being run in England, and there is every possibility that there will be a number of Continental entries and a revived interest in the Bowden itself. Mr. Bowden states the original conditions will be considered in 1952.

The one remaining precision contest on the British program is now the Hamley Trophy where three flights are allowed each with 20 seconds motor run. The goal duration is a total flight time of 40 seconds. One point is deducted for every second over or under a 40 second flight duration, and for every second over or under the stipulated 20 seconds motor run. The winner is the entrant with the lowest points score. Again R.O.G. launch is obligatory.

Neither the Bowden in its original form, or the Hamley has produced a definite type or class or model. Basically the requirements are for a stable, under-powered semi-scale machine (since points were originally awarded in the Bowden for this feature, designed to rule out any pylon entry!). In other words, the sports type gas model for Sunday flying is just about typical of the precision model, aiming then to get in as much flying practice as possible and really know the performance of the machine.

One of the most noteworthy features of recent precision contests has been the increasing number of biplane entries. Over the past year or so the biplane has come to the fore as a popular sports gassie and biplanes filled the first three places in the 1950 Bowden (the last to the old rules). Usually, however, the number of individual entries for precision events can be numbered in tens as opposed to the hundreds favoring duration.

Yugoslavian towliner with effective lift spoilers for dethermalizer.

Fig. 11—One of those mysterious Russian designs, neat FAI sailplane.

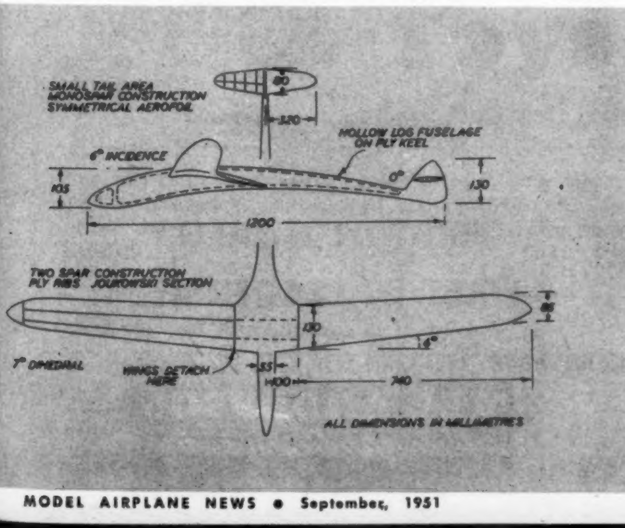
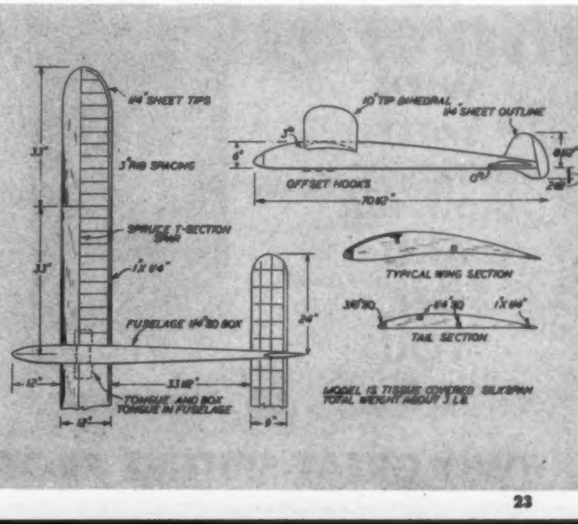


Fig. 12—Giant British glider. Note the tongue-box knock-off wings.



Frank Evans.

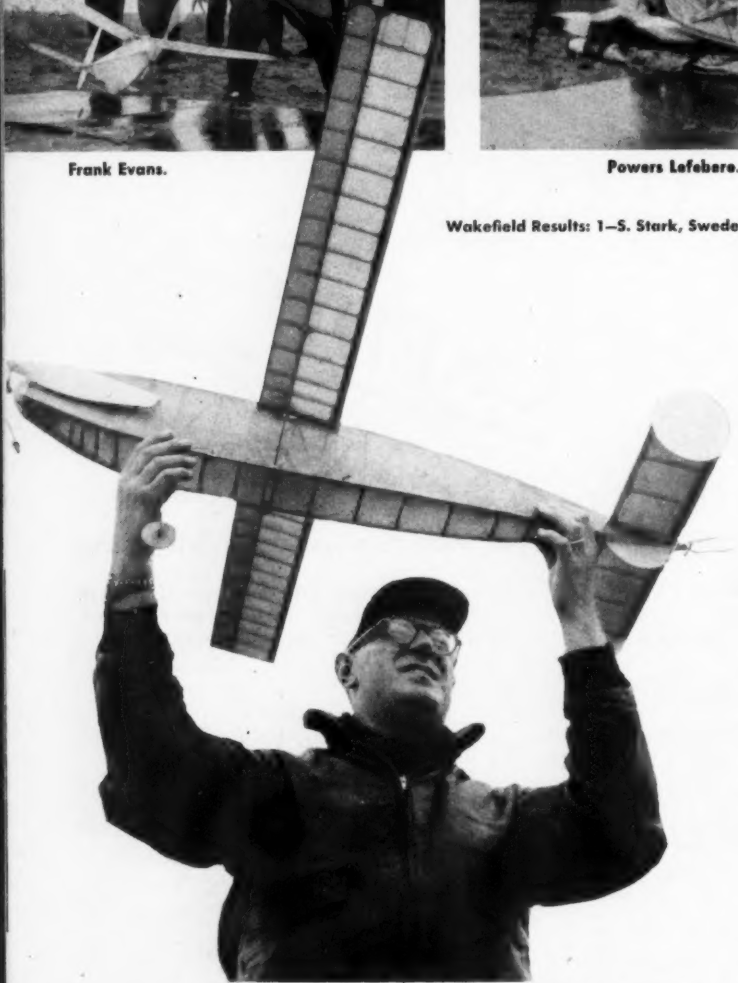
Powers Lefebere.

R. Walters.

Wakefield Results: 1—S. Stark, Sweden, 705.2; 2—H. Tubbs, Great Britain, 676.2; 3—S. Lustrati, Italy, 664.2.

Wakefield Preview

▶ Sampling area eliminations and semi-finals for the selection of the 1951 American team, photogs Arthur Silberberg and John Schneider visited the New York eliminations at Asbury Park, N. J. Because of the radical new rules much was expected, although no one knew exactly what. An all-day drizzle made the test a tough one. The low ceiling snafued at least one high-climbing flight. After 25 determined Wakefielders fought it out, Al Van Wymersch, had a first-place total time of 7:57. Designs were as varied and unusual as the rules had promised. Long moment arms—Blend's ship was 78" long, and long, thin wings abounded. There were some gears, notably Van Wymersch, and even a push-pull. In the June 11 semi-finals Van Wymersch was nosed out by Baltimore's Austin Hofmeister with a total of just under seven minutes, on another foul day of high winds. Meanwhile, the Coast's Manuel Andrade and Joe Foster flew ultra-long jobs to near maximum time to place from their area. Disregarding other areas, the result is a combination of bad and good weather machines.



Belgian 1938 finalist, Al Van Wymersch, holds New York area elimination's winner. Two geared motors, knock-off wings attached to dowels and two struts.

Praying mantis with more than 40 stations, by Grover Blend, had good glide but take-off troubles. Thin looking wing gets its strength from a unique box-spar design.

Charlie Mack demonstrated removable prop blade which was replaceable. Clay on bottom testifies to the strength of wind.

Bob Hatschek.

Robert Nelson.

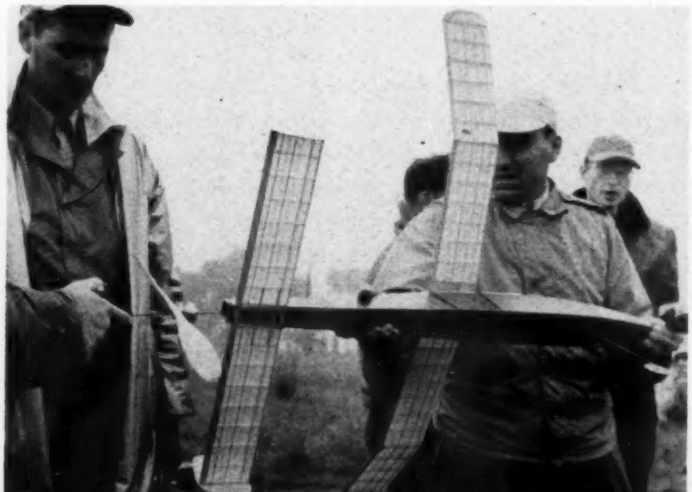
Natale Giovine.

Modified Ritz-type wing in combination with a fixed pylon mount distinguished entry by Stan Pillersdorf. Note chute dethermalizer housing.

Old timer Johnny Romanowski stuck to a diamond cross section, with wing mounted on a sliding wire parasol frame. Vertical tail balsa sheet.

Dick Salzer displays job developed with Stou Savage. Tried quarter- and half-scale models first. Cathedral in stab; fuse-operated landing gear.

Bryan Cockshutt used British type tongue-and-box wing mounting, Swedish Isaacson airfoil. Non-folding free-wheeling propeller, single wheel.



Double-trouble push-pull by Ed Beshar showed good flight characteristics but lack of time for trimming pushed it down to 14th. Skids on rudders gave clearance for prop.

Long moment arm and diamond fuselage distinguished Irving Wolk design. Sliding pylon, wing-tip fins, other features.

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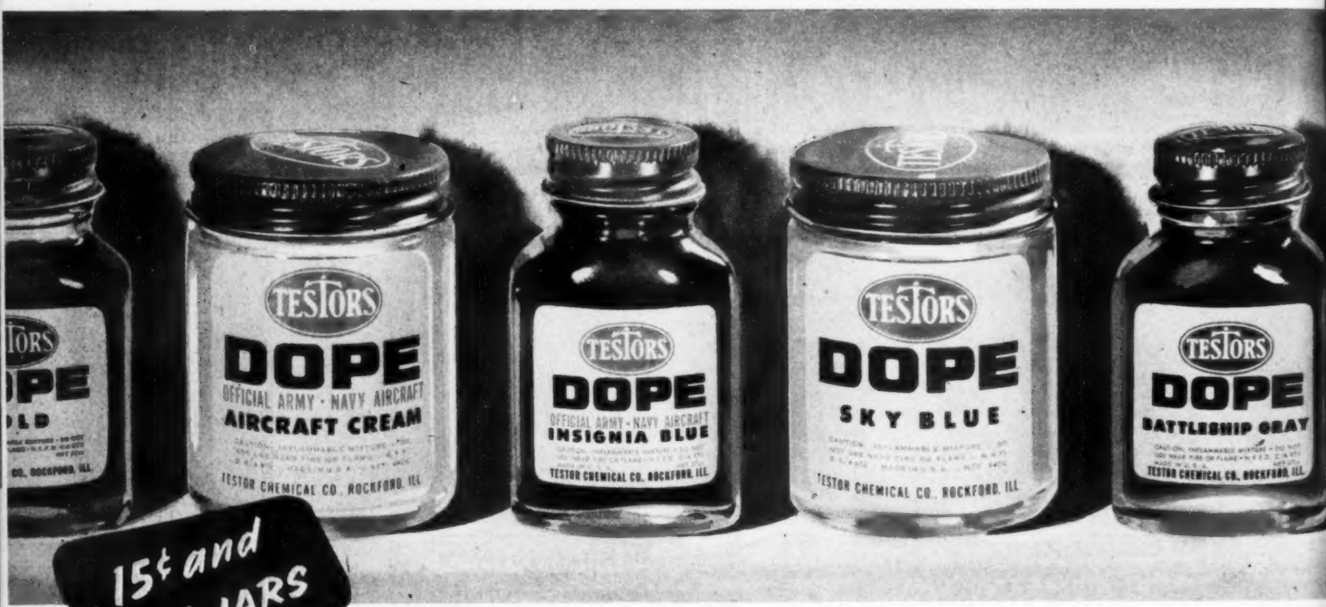

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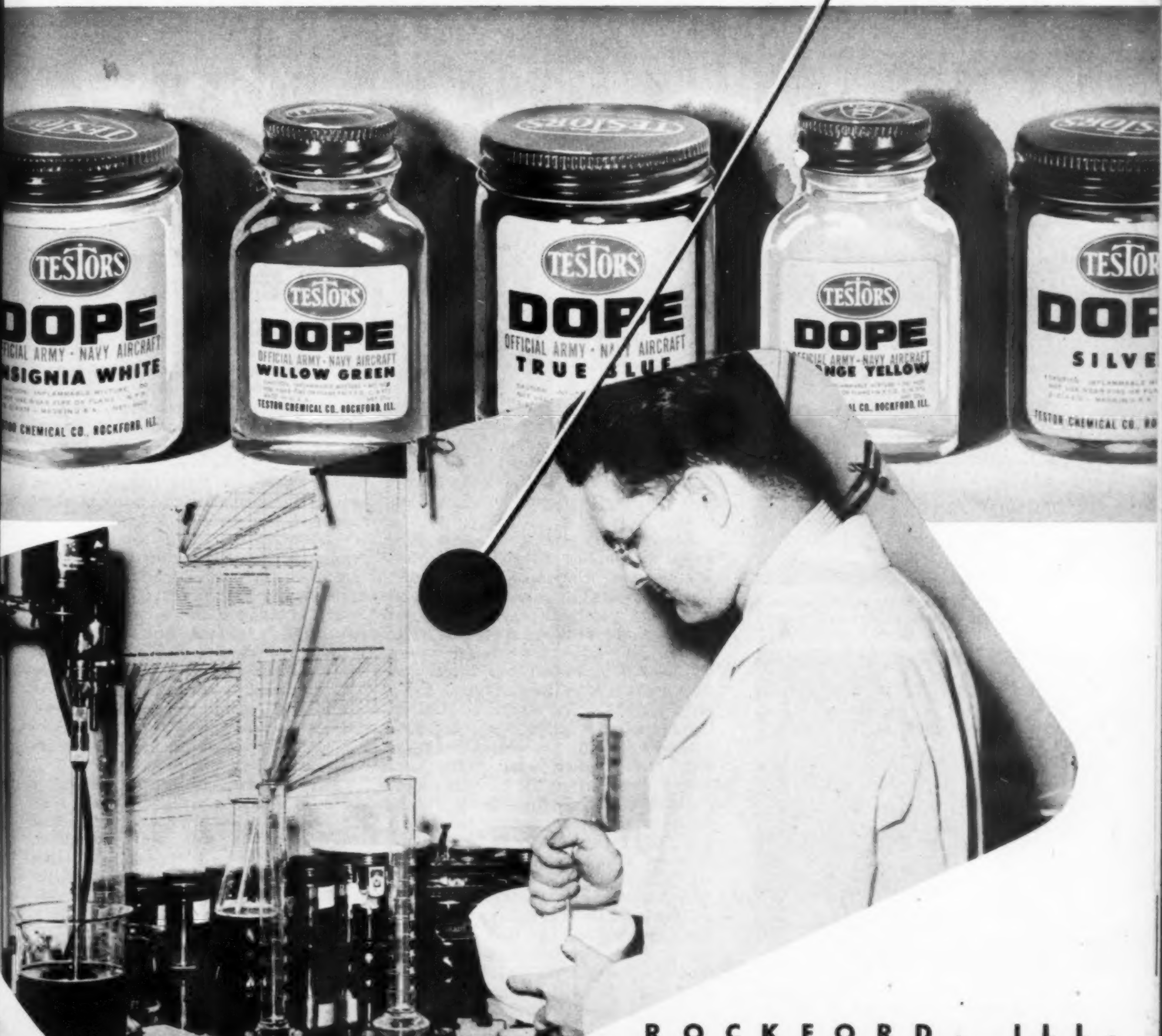
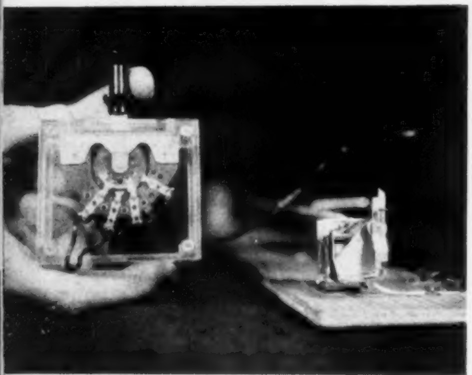


ROCKFORD, ILL.

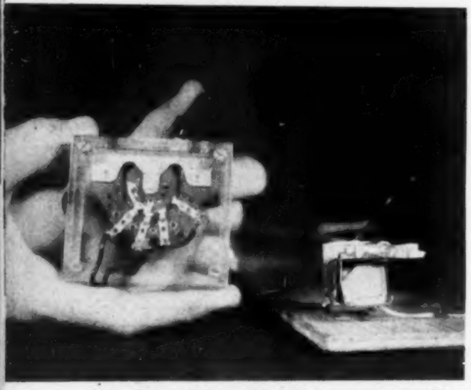
A 73-cent switch, modified escapement, are combined to give either left or right rudder on a single channel. No sequence!

•

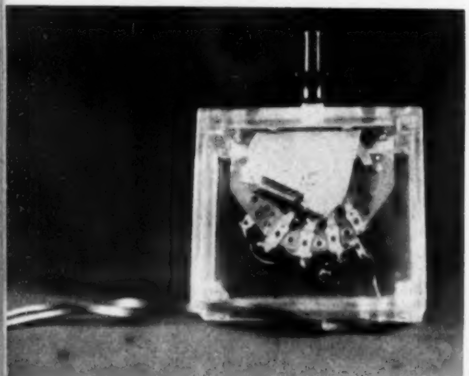
By DON GROUT



Close-up of the converted switch and the escapement. Right—Two rudder-only radio models.



Turn the switch to the right, as you would a light switch, and the escapement moves to right.



This is the reverse side of switch, showing altered wiring. Motor control also can be installed.

Exit the Beep Box

The toughest part of building and flying a radio control model lies in the flying, much to the beginner's surprise when he first wonders whether he has right or left rudder, or just neutral, as the ship pivots in the distance. Whether or not he really knows can make the difference between an out-of-control flight or one that comes back to land nearby.

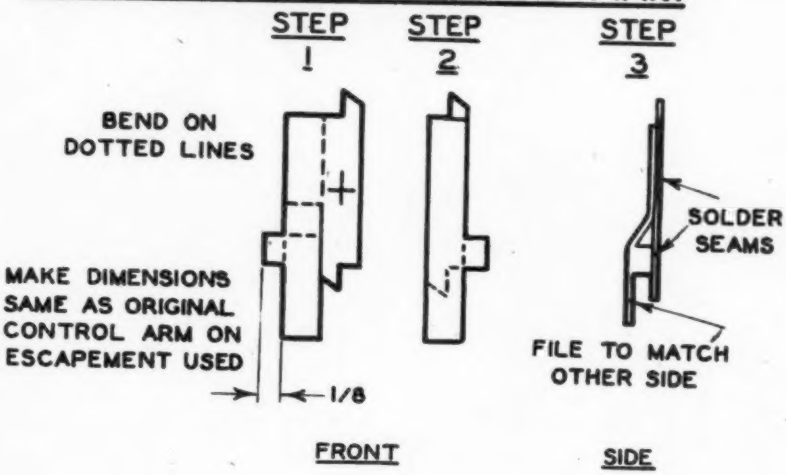
Even the fairly experienced pilot sometimes makes the mistake of thinking he made a mistake. That does it. For instance, your ship is gliding cross wind and you wish to turn into the wind for the landing. You give right rudder, let's say, and nothing happens. You wait. One second, two, three, then say, "heck it must be in neutral, so I'll give it right." You've had it! The delayed control reaction due to the wind fooled you; now the ship pivots and races away down wind while your mouth hangs open. If for any reason the ship is out of adjustment, making unequal diameter turns, as during early test flights, you have got to know what rudder position is coming up—but positively, or in a wind, you'll get fouled up and may lose the airplane.

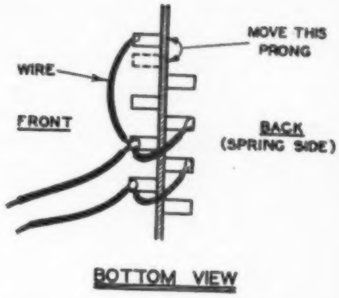
Reasons like this led to the "beep box," the original box being the motor driven drum and control stick gimmick that was shown with Walt Good's *Rudderbug* plans in this magazine. Since then it has been realized that it is possible to use excess rudder with a "beep box," because the ground control stick permits fast and repeated applications of rudder on the same side. Leave it on and you spiral, but apply it several times briefly and you can get the degree of turn you want. In effect, you also have left or right rudder on command without having to think at all of what rudder position is next.

Recently becoming interested in radio control, the writer purchased a set in kit form which contains a standard switch for control, and immediately could see the advantage of a control box, as has been written in a number of articles. But since the cost of the radio unit was approximately $20, it didn't seem plausible to spend almost the same amount to make a good motor-powered "beep box". Also it was found that the geared motors were rather hard to find.

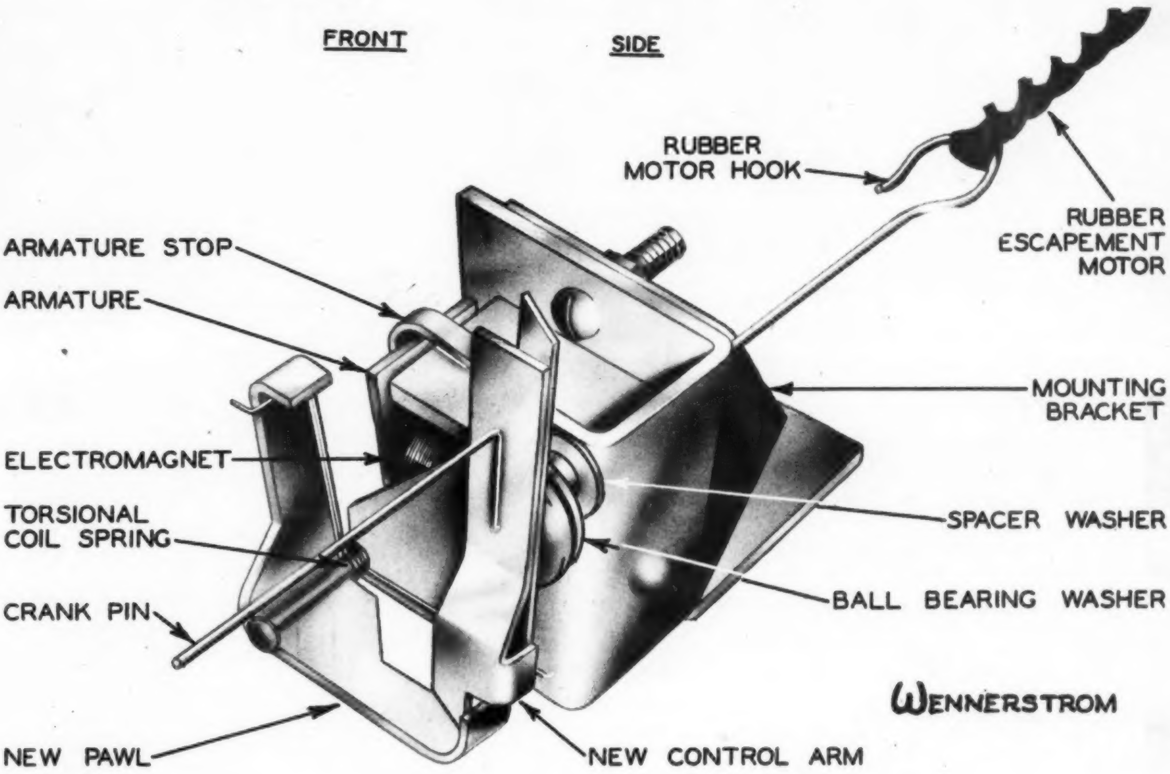
There was a good ground controller idea in *Model Airplane News*, May 1951 issue, by E. J. Brown which had no motor and was very simplified. However, it seemed possible to make one that would have a lever action with a right and left rudder on each side and return to a neutral in the center. After considerable figuring, it was evident why it had not been done before as the control handle had to move in a circle. Would it be possible to change the escape- (*Continued on page* 52)

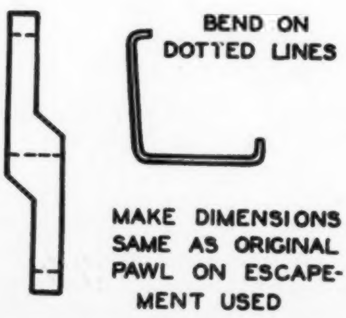
REPLACEMENT CONTROL ARM



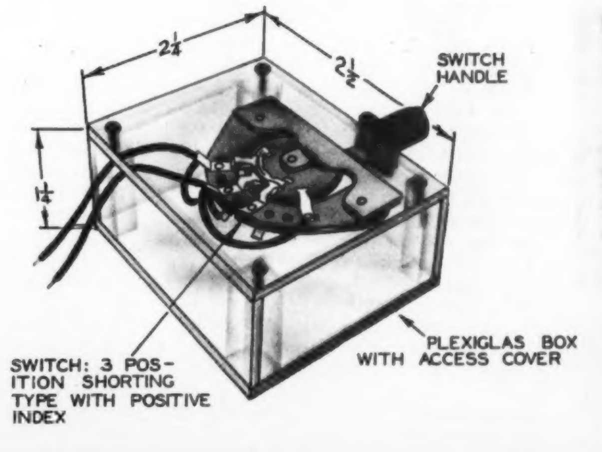


SWITCH WIRING DIAGRAM





REPLACEMENT PAWL



Spark plug behind Air Forces Nationals is Lieut. Harry Vogler who was running meets in Pittsburgh 15 years ago. Chats with Tom Baker, Plymouth Internats.

official news

Walker Sponsors Wakefield team • F.A.I. Commission Meets • F.A.I. Rules Data • New National Records • F.A.I. Records • Contest Calendar . . . .

by RUSS NICHOLS and CARL WHEELEY

Jim Walker Sponsors U. S. Wakefield Team. Thanks to the combined efforts of Jim Walker and AMA Wakefield Committtee men Ed Lidgard, Bill Fletcher, and Russ Johnson, our team is competing in person this year at the finals in Finland.

The following have qualified for positions on the U. S. Team with their fine flying at both the Eliminations and Semi-Finals in various sections of the country. Shown are their names, home towns, and total times at the Semi-Finals. Dave Kneeland, Hickman Mills, Mo.—12:25.5; Joseph Elgin, Cleveland, O.—12:13.0; Austin Hofmeister, Baltimore, Md.—6:57.9; George Perryman, West Point, Ga. —9:18.8; Manual D. Andrade, Oakland, Calif.—13:28.9; Joseph Foster, Jr., San Jose, Calif.—13:09.3.

Their itinerary was arranged as follows: July 3: Luncheon in New York City at the Wings Club. Leave at 4:00 P. M. on Pan American World Airways' non-stop flight to London; July 4: Arrive at London 10:00 A.M. and be met by Percy Chorley, AMA continental representative, who has arranged for the team's lodging that night in London; July 5: English and U. S. teams split and leave London together on two chartered planes this A. M.—planes arrive at Pori, Finland, in the P. M.; July 6: Processing and batting-the-breeze; July 7 and 8: Flying—the banquet will be held on July 8; July 9: Return to England—the team is then free to tour as they choose.

F.A.I. Model Commission Meets. The F.A.I. Commission Internationale Des Modeles Reduits met at Brussels, Belgium, from July 4 to 11 to discuss international modeling affairs. On hand to represent U. S. modelers was Charles S. Logsdon, Director of N.A.A.'s Contest Division, armed with a number of proposals (*Continued on page* 42)

Cleveland small fry need help to tote off trophies at Fourth Annual Model Plane Exhibit, for Community Chest. Attracted thousand entries.

A surrendered *D.VII* at McCook Field (now Wright Field). With a six-cylinder Liberty substituted for Mercedes, flight tests indicated 120 mph top speed.

Fokker D.VII

by ROBERT C. HARE

After thirty years, the D.VII remains one of the most controversial ships in history. This is the plane's true story.

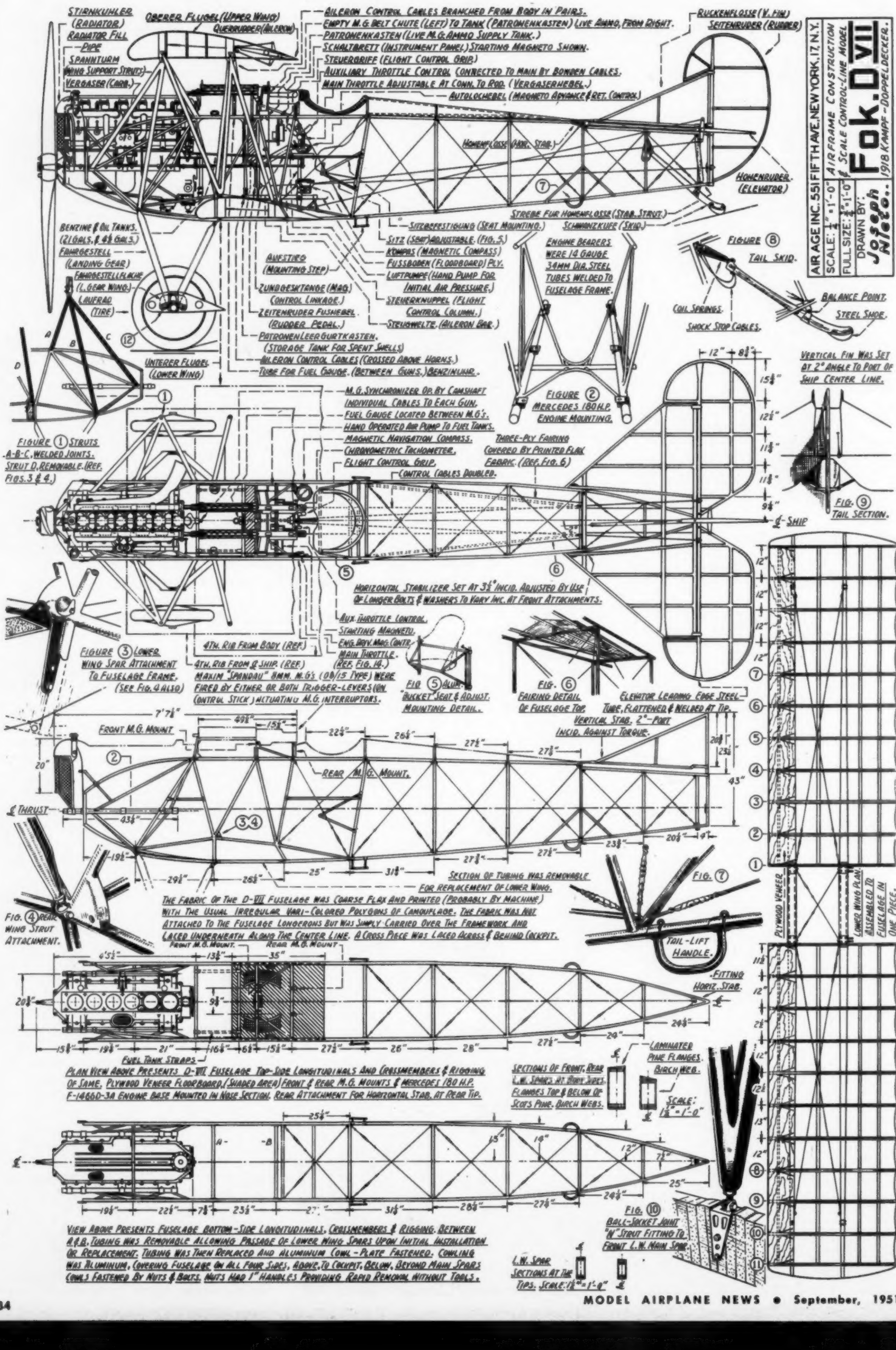
The design background of the Fokker *D.VII* has often been explained and is believed by many World War I enthusiasts, as having centered entirely around Anthony Fokker's squabble with German authorities over procurement of Mercedes engines for his planes. Actually, Fokker was perhaps justified in feeling badly towards the Germans. Apparently for political reasons, Imperial Air Service procurement had shunted almost all Mercedes engines to other manufacturers, leaving to him the less powerful powerplants such as the Oberursel. This explained the 110 hp Fokker *D.I* triplane which came out in competition with the various 160 hp Mercedes-engined Albatros single seaters and other makes in the same class.

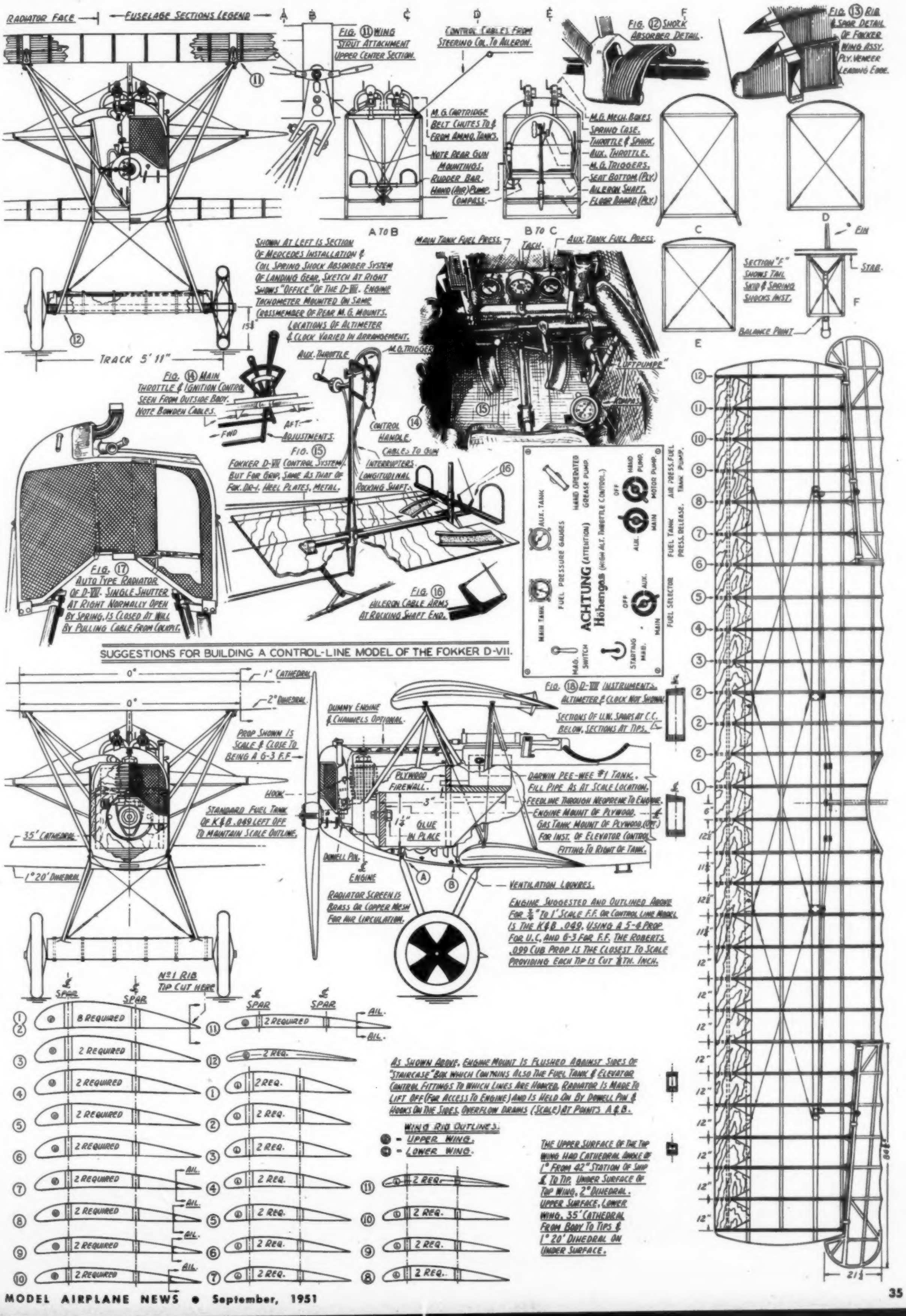
Fokker had complained bitterly that, given the 160 hp Mercedes in quantity, he could turn out a better plane than his competitors, using the same powerplant. The popular conception is that once a Mercedes got into his hands, Fokker suddenly produced the *D.VII*, entered it into a design competition, and walked away with the contracts.

It wasn't quite as easy as all that. Historically, the design of the *D.VII* was the result of a succession of experiments in which Fokker tried to sell the thick, cantilever wing idea to German authorities. It began with his sensational model *V.I* of early 1916, which was a full cantilever biplane with a circular built-up fuselage nosed by a rotary engine. Too radical for its time, the ship proved an inspiration for later Fokker models particularly in respect to wing structure. Following the Fokker triplane, Fokker brought out model *D.VI*, a rotary engined biplane with cantilever wings connected by single "N" struts and without interplane wiring, as in the *D.VII*. The *D.VI* was used by several German squadrons at the Front, and was in service to a limited degree in the middle of 1918.

Characteristic of the *D.VI* was its fuselage, almost identical to that used on the Fokker triplane. The empennage also followed the configuration of the triplane's tail surfaces. Wings, however, were roughly rectangular in plan, with balanced ailerons, and tapered in chord thickness toward the tips. Following the (*Continued on page* 45)

Grand-daddy of *D.VII*, the *V.II*, was so sensitive on the controls, it was set aside until the *D.VII*.


AIR AGE INC. 551 FIFTH AVE, NEW YORK, 17, N.Y.
SCALE: 1/4" = 1'-0"
FULL SIZE: 2" = 1'-0"
AIRFRAME CONSTRUCTION
1/6 SCALE CONTROL-LINE MODEL
DRAWN BY: Joseph Nieto.
Fok. D VII
1918 KAMPF-DOPPELDECKER.
STIRNKUHLER (RADIATOR)
RADIATOR FILL PIPE
SPANNTURM (WING SUPPORT STRUTS)
VERGASER (CARB.)
OBERER FLUGEL (UPPER WING)
QUERRUDER (AILERON)
AILERON CONTROL CABLES BRANCHED FROM BODY IN PAIRS.
EMPTY M.G. BELT CHUTE (LEFT) TO TANK (PATRONENKASTEN) LIVE AMMO, FROM RIGHT.
PATRONENKASTEN (LIVE M.G. AMMO SUPPLY TANK.)
SCHALTBRETT (INSTRUMENT PANEL) STARTING MAGNETO SHOWN.
STEUERGRIFF (FLIGHT CONTROL GRIP.)
AUXILIARY THROTTLE CONTROL CONNECTED TO MAIN BY BOWDEN CABLES.
MAIN THROTTLE ADJUSTABLE AT CONN. TO ROD. (VERGASERHEBEL.)
AUTOLOCHEBEL (MAGNETO ADVANCE & RET. CONTROL)
RUCKENFLOSSE (V. FIN)
SEITENRUDER (RUDDER)
HOHENFLOSSE (HOR. STAB.)
HOHENRUDER. (ELEVATOR)
STREBE FUR HOHENFLOSSE (STAB. STRUT.)
SCHWANZKUFE (SKID.)
SITZBEFESTIGUNG (SEAT MOUNTING.)
SITZ (SEAT) ADJUSTABLE. (FIG. 5.)
KOMPAS (MAGNETIC COMPASS)
FUSSBODEN (FLOORBOARD) PLY.
LUFTPUMPE (HAND PUMP FOR INITIAL AIR PRESSURE.)
STEUERKNUPPEL (FLIGHT CONTROL COLUMN.)
STEUERWELLE (AILERON BAR.)
BENZINE & OIL TANKS. (21 GALS. & 4 1/2 GALS.)
FAHRGESTELL (LANDING GEAR)
FAHRGESTELLFLACHE (L. GEAR WING.)
LAUFRAD (TIRE)
AUFSTIEG (MOUNTING STEP)
ZUNDGESTANGE (MAG. CONTROL LINKAGE.)
ZEITENRUDER FUSHEBEL (RUDDER PEDAL.)
PATRONENLEERGURTKASTEN. (STORAGE TANK FOR SPENT SHELLS)
AILERON CONTROL CABLES (CROSSED ABOVE HORNS.)
TUBE FOR FUEL GAUGE. (BETWEEN GUNS.) BENZINUHR.
UNTERER FLUGEL (LOWER WING)
ENGINE BEARERS WERE 14 GAUGE 34MM DIA. STEEL TUBES WELDED TO FUSELAGE FRAME.
FIGURE 2 MERCEDES 180 H.P. ENGINE MOUNTING.
FIGURE 8 TAIL SKID.
COIL SPRINGS.
SHOCK STOP CABLES.
BALANCE POINT.
STEEL SHOE.
VERTICAL FIN WAS SET AT 2° ANGLE TO PORT OF SHIP CENTER LINE.
FIG. 9 TAIL SECTION.
FIGURE 1 STRUTS A-B-C, WELDED JOINTS. STRUT D, REMOVABLE. (REF. FIGS. 3 & 4.)
M.G. SYNCHRONIZER OP. BY CAMSHAFT INDIVIDUAL CABLES TO EACH GUN.
FUEL GAUGE LOCATED BETWEEN M.G.'S.
HAND OPERATED AIR PUMP TO FUEL TANKS.
MAGNETIC NAVIGATION COMPASS.
CHRONOMETRIC TACHOMETER.
FLIGHT CONTROL GRIP.
CONTROL CABLES DOUBLED.
THREE-PLY FAIRING COVERED BY PRINTED FLAX FABRIC. (REF. FIG. 6)
℄ SHIP
HORIZONTAL STABILIZER SET AT 3 1/2° INCID. ADJUSTED BY USE OF LONGER BOLTS & WASHERS TO VARY INC. AT FRONT ATTACHMENTS.
AUX. THROTTLE CONTROL.
STARTING MAGNETO.
ENG. DRIV. MAG. CONTR.
MAIN THROTTLE. (REF. FIG. 14.)
4TH. RIB FROM BODY (REF.)
4TH. RIB FROM ℄ SHIP. (REF.)
MAXIM "SPANDAU" 8MM. M.G.'S (08/15 TYPE) WERE FIRED BY EITHER OR BOTH TRIGGER-LEVERS (ON CONTROL STICK) ACTUATING M.G. INTERRUPTORS.
FIGURE 3 LOWER WING SPAR ATTACHMENT TO FUSELAGE FRAME. (SEE FIG. 4 ALSO)
FIG. 5 ALUM. "BUCKET" SEAT & ADJUST. MOUNTING DETAIL.
FIG. 6 FAIRING DETAIL OF FUSELAGE TOP.
ELEVATOR LEADING EDGE STEEL TUBE, FLATTENED & WELDED AT TIP.
VERTICAL STAB. 2°-PORT INCID. AGAINST TORQUE.
FRONT M.G. MOUNT
REAR M.G. MOUNT.
℄ THRUST
SECTION OF TUBING WAS REMOVABLE FOR REPLACEMENT OF LOWER WING.
FIG. 4 REAR WING STRUT ATTACHMENT.
FIG. 7
TAIL-LIFT HANDLE.
THE FABRIC OF THE D-VII FUSELAGE WAS COARSE FLAX AND PRINTED (PROBABLY BY MACHINE) WITH THE USUAL IRREGULAR VARI-COLORED POLYGONS OF CAMOUFLAGE. THE FABRIC WAS NOT ATTACHED TO THE FUSELAGE LONGERONS BUT WAS SIMPLY CARRIED OVER THE FRAMEWORK AND LACED UNDERNEATH ALONG THE CENTER LINE. A CROSS PIECE WAS LACED ACROSS & BEHIND COCKPIT.
PLYWOOD VENEER
LOWER WING PLAN ASSEMBLED TO FUSELAGE IN ONE PIECE.
FITTING HORIZ. STAB.
FUEL TANK STRAPS
PLAN VIEW ABOVE PRESENTS D-VII FUSELAGE TOP-SIDE LONGITUDINALS AND CROSSMEMBERS & RIGGING OF SAME, PLYWOOD VENEER FLOORBOARD, (SHADED AREA) FRONT & REAR M.G. MOUNTS & MERCEDES 180 H.P. F-1466D-3A ENGINE BASE MOUNTED IN NOSE SECTION. REAR ATTACHMENT FOR HORIZONTAL STAB. AT REAR TIP.
SECTIONS OF FRONT, REAR L.W. SPARS AT BODY SIDES. FLANGES TOP & BELOW OF SCOTS PINE. BIRCH WEBS.
LAMINATED PINE FLANGES. BIRCH WEB.
SCALE: 1 1/2" = 1'-0"
FIG. 10 BALL-SOCKET JOINT "N" STRUT FITTING TO FRONT L.W. MAIN SPAR.
VIEW ABOVE PRESENTS FUSELAGE BOTTOM-SIDE LONGITUDINALS, CROSSMEMBERS & RIGGING. BETWEEN A & B, TUBING WAS REMOVABLE ALLOWING PASSAGE OF LOWER WING SPARS UPON INITIAL INSTALLATION OR REPLACEMENT. TUBING WAS THEN REPLACED AND ALUMINUM COWL-PLATE FASTENED. COWLING WAS ALUMINUM, COVERING FUSELAGE ON ALL FOUR SIDES, ABOVE, TO COCKPIT, BELOW, BEYOND MAIN SPARS COWLS FASTENED BY NUTS & BOLTS. NUTS HAD 1" HANDLES PROVIDING RAPID REMOVAL WITHOUT TOOLS.
L.W. SPAR SECTIONS AT THE TIPS. SCALE: 1 1/2" = 1'-0"



RADIATOR FACE
FUSELAGE SECTIONS LEGEND
A B C D E F
FIG. 11 WING STRUT ATTACHMENT UPPER CENTER SECTION.
CONTROL CABLES FROM STEERING COL. TO AILERON.
FIG. 12 SHOCK ABSORBER DETAIL.
FIG. 13 RIB & SPAR DETAIL OF FOKKER WING ASSY. PLY. VENEER LEADING EDGE.
M.G. CARTRIDGE BELT CHUTES TO & FROM AMMO. TANKS.
NOTE REAR GUN MOUNTINGS.
RUDDER BAR.
HAND (AIR) PUMP.
COMPASS.
M.G. MECH. BOXES.
SPRING CASE.
THROTTLE & SPARK.
AUX. THROTTLE.
M.G. TRIGGERS.
SEAT BOTTOM (PLY.)
AILERON SHAFT.
FLOOR BOARD (PLY.)
A TO B
B TO C
MAIN TANK FUEL PRESS.
TACH.
AUX. TANK FUEL PRESS.
SHOWN AT LEFT IS SECTION OF MERCEDES INSTALLATION & COIL SPRING SHOCK ABSORBER SYSTEM OF LANDING GEAR. SKETCH AT RIGHT SHOWS "OFFICE" OF THE D-VII. ENGINE TACHOMETER MOUNTED ON SAME CROSSMEMBER OF REAR M.G. MOUNTS. LOCATIONS OF ALTIMETER & CLOCK VARIED IN ARRANGEMENT.
SECTION "F" SHOWS TAIL SKID & SPRING SHOCKS INST.
FIN
STAB.
BALANCE POINT
TRACK 5' 11"
FIG. 14 MAIN THROTTLE & IGNITION CONTROL SEEN FROM OUTSIDE BODY. NOTE BOWDEN CABLES.
FWD
AFT ADJUSTMENTS.
AUX. THROTTLE
M.G. TRIGGER
CONTROL HANDLE.
CABLE TO GUN INTERRUPTERS.
LONGITUDINAL ROCKING SHAFT.
FIG. 15 FOKKER D-VII CONTROL SYSTEM. BUT FOR GRIP, SAME AS THAT OF FOK. DR-1. HEEL PLATES, METAL.
"LUFTPUMPE"
COMPASS
FIG. 16 AILERON CABLE ARMS AT ROCKING SHAFT END.
FIG. 17 AUTO TYPE RADIATOR OF D-VII. SINGLE SHUTTER AT RIGHT NORMALLY OPEN BY SPRING, IS CLOSED AT WILL BY PULLING CABLE FROM COCKPIT.
ACHTUNG (ATTENTION)
Höhengas (HIGH ALT. THROTTLE CONTROL)
MAIN TANK
AUX. TANK
FUEL PRESSURE GAUGES
HAND OPERATED GREASE PUMP.
OFF
HAND PUMP.
MOTOR PUMP.
AIR PRESS. FUEL TANK PUMP.
FUEL TANK PRESS. RELEASE.
MAIN
AUX.
FUEL SELECTOR
MAG. SWITCH
STARTING MAG.
FIG. 18 D-VII INSTRUMENTS. ALTIMETER & CLOCK NOT SHOWN.
SUGGESTIONS FOR BUILDING A CONTROL-LINE MODEL OF THE FOKKER D-VII.
1° CATHEDRAL
2° DIHEDRAL
35' CATHEDRAL
1° 20' DIHEDRAL
PROP SHOWN IS SCALE & CLOSE TO BEING A 6-3 F.F.
HOOK
STANDARD FUEL TANK OF K&B .049 LEFT OFF TO MAINTAIN SCALE OUTLINE.
DUMMY ENGINE & CHANNELS OPTIONAL.
PLYWOOD FIREWALL.
GLUE IN PLACE
DOWELL PIN.
ENGINE
SECTIONS OF U.W. SPARS AT C.C. BELOW, SECTIONS AT TIPS.
DARWIN PEE-WEE #1 TANK. FILL PIPE AS AT SCALE LOCATION. FEEDLINE THROUGH NEOPRENE TO ENGINE. ENGINE MOUNT OF PLYWOOD. GAS TANK MOUNT OF PLYWOOD (OPT.) FOR INST. OF ELEVATOR CONTROL FITTING TO RIGHT OF TANK.
VENTILATION LOUVRES.
RADIATOR SCREEN IS BRASS OR COPPER MESH FOR AIR CIRCULATION.
ENGINE SUGGESTED AND OUTLINED ABOVE FOR ½" TO 1' SCALE F.F. OR CONTROL LINE MODEL IS THE K&B .049, USING A 5-4 PROP FOR U.C. AND 6-3 FOR F.F. THE ROBERTS .099 CUB PROP IS THE CLOSEST TO SCALE PROVIDING EACH TIP IS CUT ⅛TH. INCH.
No 1 RIB TIP CUT HERE
SPAR
8 REQUIRED
2 REQUIRED
2 REQ.
AIL.
AS SHOWN ABOVE, ENGINE MOUNT IS FLUSHED AGAINST SIDES OF "STAIRCASE" BOX WHICH CONTAINS ALSO THE FUEL TANK & ELEVATOR CONTROL FITTINGS TO WHICH LINES ARE HOOKED. RADIATOR IS MADE TO LIFT OFF (FOR ACCESS TO ENGINE) AND IS HELD ON BY DOWELL PIN & HOOKS ON THE SIDES. OVERFLOW DRAINS (SCALE) AT POINTS A & B.
WING RIB OUTLINES.
- UPPER WING.
- LOWER WING.
THE UPPER SURFACE OF THE TOP WING HAD CATHEDRAL ANGLE OF 1° FROM 42" STATION OF SHIP ℄ TO TIP. UNDER SURFACE OF TOP WING, 2° DIHEDRAL UPPER SURFACE. LOWER WING, 35' CATHEDRAL FROM BODY TO TIPS & 1° 20' DIHEDRAL ON UNDER SURFACE.
21½

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New and Exciting S

F-8 AB

All

Easily maneuvered, mendous speed and ly fire power has the F-86 the work- of fighter aircraft in Korea theatre. Build SPEEDEE-BILT MOD You'll get a real kick of its swept-back w faithful prototype d and its all 'round appearance. Kit Num G-13.

stic Cowl
stic Pilot
stic Rock
stic Exha
ous Mo
Right an
fabricate
nd Tail
Full Colo
Cut

CORSAIR F4U-5

A thrill to look at and the most efficient carrier-based aircraft of World War II. That's the Vought Corsair. Now also used as a land-based straffer and bomber providing cover and blasting power for U. N. forces in the East. Get this gull-winged SPEEDEE-BILT MODEL with plastic cannon. Build it today. Kit Number G-14.

See This Exciting Corsair Parts List

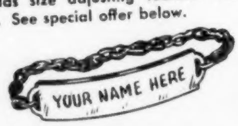
- Four-Bladed Plastic Prop
- Plastic Cannon
- Plastic Pilot
- Plastic Cowl
- Prefabricated Fuselage and Tail Parts, in Full Color and Precision Die Cut
- Monofoil Wings (Right, Left and Center Sections)
- Three-Color Genuine Decals
- Rubber Wheels
- Landing Gear (Specially Formed)
- Plastic Canopy (Detail Molded)
- Rubber Loop
- Detail Picture Plan

AND 11 OTHER PARTS

Fellows Wear a Pilot's Cap and Identification Tag

The popular long-peak pilot's cap that smart fellows are wearing. Colorful durable fabric for long wear. Has size adjusting feature. Fits all sizes. See special offer below.

Airplane metal identification tag with your name engraved on it. Attractive metal chain with safety catch, to fit the wrist. See special offer below.



How You Can Get Them

Mail to Monogram the end flap from a SPEEDEE-BILT box. Send the part that tucks inside from—either a SABRE JET, CORSAIR or WARHAWK box—and 25 cents in coin for either the pilot's cap or identification tag. If you want both the cap and the tag send the end panel from two SPEEDEE-BILT boxes and 50 cents in coin. Be sure to print your name PLAIN. Mail to Monogram Models, Inc., Dept. 48, 225 North Racine Avenue, Chicago 7, Ill.

WARHAWK P-40F

An airplane the world will never forget. As the "Tiger Shark" it gave valia service in China. Later, the Warhawk was an effective power house in No Africa. Build this SPEEDEE-BILT MODEL and the Warhawk will be the most pop lar plane in your collection. Three-Bladed plastic prop and ferocious tiger mou decals are some of the extras you get in this kit. Kit Number G-15.

Build the Warhawk With These Parts

- Three-Bladed Plastic Prop With Plastic Spinner
- Plastic Pilot
- Plastic Exhausts
- Plastic Cowling
- Prefabricated Fuselage and Tail Parts, in Full Color and Precision Die Cut
- Monofoil Wing (Left and Right)
- Formed Plastic Canopy
- Rubber Wheels
- Complete Landing Gear
- Three-Color Genuine Decals
- Rubber Loop
- Detail Picture Plans

AND 12 OTHER PARTS

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MONOGRAM MODEL NC.

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MONOGRAM'S

SPEEDEE-BILT *flying models*

8 ABRE JET

All These Parts in This Kit

- stic Cowling
- stic Pilot
- stic Rockets (4)
- stic Exhaust
- nous Monofoil Wing (Right and Left)
- fabricated Fuselage and Tail Parts, in Full Color and Die Cut
- Plastic Canopy (Detail Molded)
- 3-Color Decals
- Rubber Wheels
- Metal Landing Gear, (Specially Formed)
- Detail Picture Plans

AND 9 OTHER PARTS

our ealer

no dealer in your neighborhood, send der to address below. Enclose 25 cents ditional for packing and shipment from arby dealer's stock.

The Three Most Sensational Kits Ever Produced by Monogram

READY ABOUT AUGUST 15th

You asked for more SPEEDEE-BILT MODELS fellows! And here they are. In thousands of letters sent us you most often named these three planes as the next models you wanted to build. And what kits we have made for you! They're sensational! The three finest and most exciting airplane kits Monogram has ever produced.

We are so proud of these new SPEEDEE-BILT KITS that we've included a list of all the parts so you can see what amazing things each kit contains. We also give you air-view and ground-view pictures of each model so you can see just how each plane looks when finished.

Get these new SPEEDEE-BILT MODELS at your favorite store. You'll find them, like your other favorite SPEEDEE-BILT MODELS, the easiest of all to build but with greater thrills and more fun than you ever got out of a model before.

Each Kit Only

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Scale Flying Models with All These Plastic Parts

PROPELLERS— THREE AND FOUR BLADED
CANNON • ROCKETS
PILOTS • COWLS
CANOPIES • ETC.

About August 15th

NC. • 225 N. RACINE AVENUE • CHICAGO, 7 ILL.

Good as a Monogram Model and that is Another Monogram Model

Scrap Box

(*Continued from page* 5)

is possible and practical for precision straight away and pylon flying.

• • •

A prize chuckle comes from Bob Garrett of Madison, Tennessee. Seems that one of the newcomers to the flying circles was having a bit of trouble starting his *Baby Spitfire* powered *Dakota*. After flipping the prop for about three hours, he decided to go down to the field for some instructions on how to start an engine. All the necessary equipment was on hand, including a long piece of iron pipe. He was told to hook up the batteries and amazed all hands by driving the pipe into the ground, hooking the positive wire to the glo-plug and the negative wire to the piece of pipe in the ground. Bet the kid will have a flock of trophies within a year. When we started flying we flipped our prop in the wrong direction for two weeks (in the ignition days) before someone told us to try it the other way. The darned thing fired right off and almost took three fingers with it.

• • •

Dan Hodges of Oklahoma fires a gun in defense of the older modelers. The Juniors are over-emphasized, sez he, then gives out with more of the same. Young modelers should get all the encouragement possible but false praise and publicity does the hobby more harm than good. The hobby is definitely not for youngsters alone. Older modelers are the backbone of the hobby. Publicity and pics of the small fry alone don't sit too well. Ed Liggard voiced an opinion against model building and flying being referred to as a program for "youth." "Why can't we have more emphasis on the hobby as one for *all* ages, oldtimers as well as youngsters?" We heartily agree!

George Ens of Woodstock, Ontario, Canada, has the right idea. He's been instructing a club of over 35 youngsters under fifteen years of age. The Woodstock Rotary Club sponsors the boys (of the "Y" Rotary Model Aero Club) and meetings are held at the YMCA each Wednesday night. A Wakefield Trainer from the 1950 January issue of M.A.N. was used as a club project. Plans were scaled up and prints made. The ship proved to be a swell flyer. Any and all types of kits are built under the excellent supervision of George and two helpers. Here's a darned good way to keep the younger element interested in a mighty fine project. Friendly competition both in building and flying will have plenty of youngsters out with good ships. We need more fellows like you and your helpers, George Ens.

• • •

Dennis Alford and Bobby Erhardt are back from their whirlwind tour of Portland. These are the two lads who won the Jim Walker Solo Tournament which was recently held in San Diego. After having their palms crossed with cash and merchandise awards, the kids were flown to Portland in a Convair *Luxury Liner* and were the guests of Jim "A.J." Walker for one swell week. A tour of the A.J. Aircraft plant was made first. Bobby and Dennis had the run of the town, all properly supervised, and operated Jim's famous lawnmower, R.C. sail boat, *Sabre Dancer*, and anything else that suited their fancy. They managed to slip one over on Jim by getting into a soda fountain and spending about twenty cents of their own money. Walker gave each of the youngsters a bunch of *Ceiling Walkers* and *Interceptors* and equipped each with a walkie talkie. They went on their way around town flying the "gimmicks." Of course there was a scramble for each by the crowds that took in the stunt. When the supply ran out, the Genie appeared by a flick of the walkie talkie and the supply was replenished. The Portland Fireball Flying Field was visited and the kids put on a bang-up show with their ships. What a parcel of loot came home with these two tired but happy kids. We'll hear about it for the next year and rightly so. This San Diego Solo Contest was presented in the way of a guinea pig experiment and more than came up to expectations. It looks from here as if we'll be seeing more of these tournaments throughout the country sponsored by Mr. U-Control himself. Whatta guy!

—by JIM SAFTIG

Wagtail

(*Continued from page* 18)

Leave this to dry. The necessary amount of 1/2" sheet balsa can be cut, and preshaped for the upper portion and both sides of the fuselage. Before cementing these sheets in place, solder the 1/16" diameter pushrod to the bellcrank leaving a small portion extend beyond the fuselage. The lead-ins of 1/32" diameter wire are also secured to the bellcrank. The 1/2" sheet that we preshaped can now be added, and when completely dried shape to the finished contours shown on the plans.

A fuel tank detail with dimensions is given for those modelers prefering to make their own. The author assembled the tank shown from .008 brass sheet and found it to be of ample volume to give many a lap before running dry. Regardless of choice, be it the tank given or one of a commercial design, the tank should be installed at this point of construction. Be sure the filler and vent tubing are of sufficient length. Cement the tank in place, placing through the bottom forward portion of the fuselage.

The fuselage is set aside till we complete the tail surfaces; this pause will allow sufficient time for all points to dry hard. The stabilizer and elevator halves are cut from 1/8" sheet balsa. A 1/8" sq. hard wood strip is cemented to the halves of the elevator as shown; when dried sand both surfaces to their required shape. A commercial aluminum horn is trimmed to fit the elevator. The cloth hinges are doped in place. Give the completed tail surface several coats of clear dope with a gentle sanding after each application. Before cementing the stab in place, install the tail skid, shaped from 1/16" diameter wire. The tail assembly can then be cemented securely to the fuselage, tieing in the loose end of the pushrod to the horn. Allow a few hours to dry. You will note before this assembly can be done allowance must be made so that the horn will operate freely in the fuselage.

The rudder is shaped from 1/16" plywood as shown. When completed, crack and bend the fin as shown, then apply several coats of clear dope and cement to stabilizer assembly.

The wing panels are next in line for construction, beginning with the lower panel. The author suggests shaping all ribs prior to any form of wing assembly. There are 26 W-1

(*Continued on page* 40)

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CUBEE, pg. 11 & WAGTAIL, pg. 19

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wing ribs of 1/16" sheet balsa and 2 W-2 wing ribs of 1/8" sheet balsa. The leading edge is 1/2" sq. medium hard balsa; cut a sufficient amount and secure to the plans. The trailing edge is 1/4" x 3/4" strip balsa. We suggest a formed trailing edge of these dimensions; it saves us work, doing away with the carving. The wing ribs are added in any order the builder desires, taking note that the two center ribs are 1/8" sheet. As this cemented assembly is left to dry we can tackle the solid tips. A selection of soft balsa block is used in carving the wing tips. Preshape the balsa tips, and before finishing cement to the lower wing between the leading and trailing edges and butting against the end rib. Before removing this completed panel from the workbench, a word or two about the double rib spacing. Be certain that proper spacing is cemented into the strut ribs; approximately 1/8" will do the trick. This will permit the wing struts to fit snugly in place at final assembly.

Finish carving and sanding the lower wing to its proper airfoil shape; when satisfied with the results, give all areas that will come in contact with the covering material a coat of clear dope. Using medium grade *Silkspan* the panel can now be covered. Spray the papered wing with water and when pulled taut, apply three coats of clear dope and allow to dry thoroughly.

If instructions were carefully followed, the fuselage should have the necessary cut-outs to allow the lower wing to fit snugly in place. When satisfied with the fit, cement the wing panel securely in place. Be careful to get proper alignment. The points to check are the lower camber, running parallel to the thrust line, and the leading edges which should be square to the fuselage sides. Apply ample cement and set aside to dry.

The engine mounts are formed from 1/16" thick soft aluminum, a 52-S or similar material. Twenty-four-ST is difficult to bend. Build one right-hand and one left-hand mount. Screw the completed mounts in place on the firewall with wood screws. The engine cowl is made from soft balsa block with the grain running parallel to the fuselage center line. Before carving, it will be necessary to clear away a small portion of the back of the block, to fit over the aluminum mounts. Spot cement the cowl block to the firewall and proceed to carve. If the Cub .09 is used for power it will be necessary to clear the right side of the block, to allow finger control of the needle valve. A saw cut across the needle valve grip will also assist in final adjustment. An extension may be soldered to the needle valve.

When the cowl is completed and sanded, remove from the firewall and hollow to the dotted lines shown on the plans. The cowl is then securely cemented to the firewall and again all points are sanded over. Apply several coats of clear dope, with a light sanding to work down the nap.

The *Wagtail's* landing gear is simple to construct and, with the use of rubber bands, affords good shock absorbing qualities. There are two main portions to the gear, and both are formed from 1/16" diameter wire. To assemble to the fuselage, proceed in the following manner. Slit the under portion of the wing, wide enough to allow the rear section of the gear to fit snug. A similar slit is put in the fuselage. Force the wires into the silts and cement securely. While the cement is drying bind the axle portion of the gear with fine wire, and solder together. A 1/16" balsa sheet of sufficient width is cemented to the lower portion of the wing, blending in with the 1/8" sheet covering. The forward slit is sealed by forcing a 1/16" sq. strip of balsa into it, and sand smooth. The spreader is made from 1/8" aluminum tubing, with a rubber band through it and fastened to the gear as shown. The landing gear cross braces are also made from rubber bands. Solder the 2" diameter wheels in place.

When the model comes in for one of those hard and unwanted landings, all the gear joints are flexible and as a result, will return to their natural position. The landing gear struts are cut from 1/8" x 1/4" hard balsa. Groove the center of each strut 1/16" deep, then press over the landing gear wire and cement securely. The gear is now completed.

The only construction remaining is the upper wing panel. Before we start on the final stage, check the finish on what has been built.

Where necessary, use wood filler and be sure a sufficient amount of dope is applied.

The upper panel is assembled in very much the same manner as was the lower wing. The leading edge is 1/2" sq., the trailing edge 1/4" x 3/4" balsa. In building be sure to incorporate the 1/2" dihedral in each half. The center section is first to be constructed. You will note that more than half of the center section is open. The center section trailing edge is 1/2" sq. with a 1/8" sheet spar added. The ribs making up the center section are two of W-1, the balance being 1/16" sheet balsa, left oversize and shaped later. Because of the dihedral angle the wing halves are built one at a time. The tips as in the lower wing are carved from soft balsa block, and finished in a similar manner. Be careful of the double rib spacing. The center section gussets are made from 1/4" sheet balsa. When the wing is completed, remove from the plans, and finish sanding to the required airfoil. As with the lower wing give all wood a coat of clear dope. The panel is then covered, using medium grade *Silkspan*. Spray with water and when dried apply three coats of clear dope. A gentle sanding will draw down all the raised nap.

Before the upper panel is fastened in place it is advised to color dope what has thus far been completed. The fuselage is given two coats of olive drab, with a gentle sanding after the first coat. The wing and tail units are given two coats of orange yellow.

As the painting dries we can cut and shape, both the wing and the cabane struts. The cabane struts are 1/8" sq. hard wood, sanded to a streamline cross section. The wing struts are shaped from 1/8" x 1/4" hard wood, also shaped to a streamline cross section. Give the completed struts two coats of clear dope to seal the pores. Force the cabane struts into the fuselage at the points indicated, and apply a generous amount of cement. The wing struts are forced into the lower wing panel between the double ribs. Cement well. The upper panel is now assembled, forcing the upper portion of the struts into the under side of the upper wing. Check drawings for correct positions, zero degrees incidence in both wings. When the above assembly has dried, the wing-line guide is shaped from 1/32" diameter wire, and bound to the port side struts. Ordinary spool thread is used for all wire rigging.

The bulls eye insignia is applied, using the necessary color *Trim-Film*. The inner circle is red, the outer circle blue, with white between them. The bulls eye appear on both upper and lower wing surfaces, as well as both sides of the fuselage. The rudder is doped red, white, and blue. Check the plans for correct sequence.

The cockpit trim is made from 1/8" diameter rubber tubing to give the proper effect. The headrest is soft balsa block, and the windshield is .020 celluloid positioned as shown. The machine guns are made from, 1/8" sheet balsa, 1/16" and 1/4" dowel. The dummy guns are doped black and cemented to the fuselage between the cabane struts. To further complete the details add the aileron outlines, using black *Trim-Film*. Use 1/16" diameter dowel for the aileron push rods.

Final scaling would not be complete without adding the dummy cylinders. Their construction is simple, yet very effective. The cylinder is made from 1/2" diameter balsa. The rocker arm covers 1/16" balsa. To give the fin affect, wrap the cylinders with heavy black thread. The rocker arm cover is cemented to the top of the cylinder. The cylinder is then given a coat of black dope. Six cylinders are required, which in turn are cemented to the cowl in the position shown in the front view. The cylinder push rods are 1/32" diameter wire, forced into the balsa cowl and rocker arm. The completed *Wagtail* is given a coat of good fuel proofer, two coats to the engine department.

The author's *Wagtail* sported a Cub .09, turning a 7-4 Power Prop. With the engine installed and a full tank of fuel, the model should balance 1/3 back of the leading edge.

Flying a bipe on wires is somewhat different than the single plane conventional control liner. The lifting area is almost double, so care must be exercised until we are thoroughly familiar with what the model will do. Keep those lines taut with plenty of right rudder, adding lead where needed for proper balancing. For you die-hard stunt fans a stunt rib is shown. END

AMA News

(Continued from page 32)

prepared by AMA. The proposals represent the opinions of the AMA Contest Board which means also you, yourself.

Among AMA proposals were: Flying-wing type models should be more clearly defined; no wing loading requirements for control line models; no minimum fuselage cross section requirement for control line models; no categories for distance and altitude records—this proposal was on the basis that these categories do not represent a means anywhere near accurate for comparing model airplanes.

No minimum weight for reaction motor models (jets)—this would be a safety measure inasmuch as the requirement has been that models weigh at least 4 times that of the bare reaction motor; a specified distance for timing control line speed models; a specified line length and wire diameter for each class of the control line speed models.

In addition to our own proposals, Mr. Logsdon was instructed to voice our approval of the following: the Belgium proposal for a limitation of free flight gas model motor run time to 20 seconds even for record attempts provided the previous performances where no maximum limit was imposed are stricken from the records; the Belgium proposal that there be a minimum of two timers or judges for each flight in international competitions; the English proposal that there be an annual Model Aircraft Olympic Meeting. This would probably make it possible for more nations to compete in the four international championship events and reduce the amount of travelling which is involved now in seperating the four events.

F.A.I. Records. We've been listing F.A.I. (Federation Aeronautique Internationale) model aircraft records every now and then and from the response we have had, it is supposed that many of you are more than a little confused as to what the general model requirements are. A resume of the technical characteristics has been prepared and follows:

FREE FLIGHT MODELS

Dimensions: Maximum lifting surface—150 dm2 (2325 sq. in.).

Loading: Minimum—12 gr. (.4233 oz.) per dm2 (15.5 sq. ins.) of the total surface of the wing and tail.
Maximum—50 gr. (1.7637 oz.) per dm2.

Minimum fuselage cross section: Powered models—A=st÷80. Gliders—A=st÷100 (st=total surface).

Maximum piston displacements: Class I—2.5 cc (.153 cu. ins.); Class II—5 cc (.305); Class III—10 cc (.610).

Method of launching: Powered models, land-plane type—the model, resting on three points, takes off without being assisted.
Seaplane—takes off from the surface of water.
Gliders—launched either by hand or by cable of a maximum length of 100 meters (328 feet).

Power: Either rubber or mechanical motors.

CONTROL LINE MODELS

Dimensions: Maximum lifting surface—150 dm2.

Loading: Minimum—12 gr. per dm2 of total surface.
Maximum—200 gr. (7.055 oz.) per dm2 of total surface.

Maximum weight: 5 kg. (176.37 oz.).

Minimum fuselage cross section: A=st÷80.

Maximum piston displacements: Class I—2.5 cc (.153 cu. ins.); Class II—5 cc (.305); Class III—10 cc (.610).

Reaction Motors (Jet): Maximum weight of motor—500 gr. (17.637 oz.). The minimum weight of the aircraft in flying order—four times the weight of the bare reaction motor.

Method of launching: Rise-off-ground. The jettisoning of the take-off gear is permitted.

Distance of timed course: Minimum of one kilometer.

Minimum line lengths: Class I—11 meters, 37 cms. (37.3 feet); Class II—13 meters, 27 cms. (43.54 feet); Class III—15 meters, 92 cms. (52.23 feet).
Note: Larger radii may be used.

National AMA Records Pending. *Gas Models, Control Line Speed, Class A Junior*—106.09. Flight made by William Weissbrodt, Milwaukee, Wisc., on May 20. Model used was a *Hell Razor* powered by a McCoy 19.

Gas Models, Control Line Speed, Class A Open—122.84. Flight made by Charles Schuette, Hawthorne, Calif., on May 6. Model used was an original design powered by a *Torpedo .19* with a 6D x 10P *Tornado* prop. Model has a helmet cowl and metal wings with a span of 11". Model weighed 12 oz.

Outdoor Hand-launched Glider, Class A Open—8:43.2. Flights made by David M. Nelson, Tucson, Ariz., on May 27, using an original design model.

Free Flight Gas Models, Class AA Junior—21:41.4. Flights made by Clifton Highman, Bakersfield, Calif., on June 10, using a K & B *.049* powered *Zeek*, weighing 5 oz.

Free Flight Gas Models, Class A Open—28:50.0. Flights made by L. J. Kading, Compton, Calif., using an original design powered by a *Torpedo .19*. Kading's model, a pylon job, had 603 sq. ins. of wing area with an undercambered airfoil, and weighed 33 oz. Prop used was a K & B 9D x 5P.

Free Flight Gas Models, Class A Open—29:25.0. Flights made by George O. Brown, Ivanhoe, Calif., on June 10, using an original design powered by an Arden *.199* with a 10D x 4P *Tornado* prop. Brown's pylon job weighed 21 oz. had 410 sq. ins. wing area, 205 sq. in. stab, and Clark Y airfoils.

Free Flight Gas Models, Class C Open—30:00.0. Flights made by Robert L. Ottoman, Medford, Ore., on June 10 using an original design powered by a K & B *.32* with a *Top Flite* 10D x 6P prop. Ottoman's model had 594

(Continued on page 44)

sq. ins. wing area, undercambered airfoil, 297.5 sq. in. stab and underslung rudder.

Miscellaneous. "Should all records be started anew each year?" is the question of the month. Exponents of the idea of doing so figure that starting the records new each year would do much to rouse interest, especially in the events where it is nearly imposible now for a record to be exceeded. Let one of the AMA Contest Board Members for your district know what *you* think. Write to AMA, 1025 Connecticut Avenue, Washington 6, D. C., if you don't know your nearest Contest Board Member.

CONTESTS

AUGUST

5—*Minneapolis, Minn.* PAA Load contest. Write to Paul Ring, Contest Director, 2816 E. 42nd St., Minneapolis 6, Minn., for information. Pending.

5—*Akron, O.* Class A Akron Society of Model Plane Engineers' Club Contest for OHLG, TLG, and OR. Henry Thomas, Contest Director, 515 Mohawk Ave., Akron. O. Entry is restricted to members of the A.S.M.E. and residents of the Akron district.

5—*Waynesboro, Pa.* Pending.

5—*Falls Church, Va.* Control Line Meet. Write to Wilbur S. Hinman, Jr., C.D., 410 Great Falls St., Falls Church, Va., for information. Pending.

12—*Medina, O.* Class AA Medina Model Meet for FFG. R. W. Housley, C.D., 2190 23rd St., Akron 14, O.

12—*Lancaster, Pa.* Class AA 4th Annual Model Airplane Meet for FFG, CL, CLS, OR, TLG, and TR. Paul J. Liller, C.D., 567 Pershing Ave., Lancaster Pa.

12—*Springfield, O.* Class AA Fourth Annual Strato-Hawk Meet for FFG. Aaron M. Smith, C.D., 1813 Woodward Ave., Springfield, O.

19—*Hicksville, L. I., N. Y.* Class AA Long Island Invitational AA Championships for all classes of AA free flight models including R.O.G.-Type, R.O.W., Flying Scale, PAA Load, and Clipper Cargo. William K. Johnke, C.D. 601 Meadowbrook Rd., Uniondale, Hempstead, L. I., N. Y.

19—*Visalia, Calif.* Visalia Model Airplane Assn. Record Trials for FFG. Emory O. Hull, Jr., C.D., P. O. Box 284, Ivanhoe, Calif.

19—*Medford, Ore.* Class AA 5th Annual Medford Prop Nuts Free Flight Contest for FFG; OR, Jetex, and TLG. Edgar H. Sims, C.D., 23 North Fir, Medford, Ore.

19—*Indianapolis*, Ind. Class AAA Midwestern States Model Airplane Meet for FFG, OR, TLG, CL, CLS and CLFS. William E. Clarkson, C.D., 777 No. Meridian St., Indianapolis 4, Ind.

22-27—*Detroit, Mich.* Class AAAA Ltd. Fifth International Model Plane Contest. Events scheduled are OR, OHLG, FFG, CL, CLFS, CLS, TR, Navy Carrier, and Combat. See your Plymouth dealer for information.

26—*Valley Stream, L. I., N. Y.* 8th Annual Eastern Championships. Pending.

SEPTEMBER

2—*Medina, O.* Class AA Second Annual Medina Model Meet for all outdoor events excepting TR and CL Jet. R. W. Housley, C.D., 2190 23rd St., Akron 14, O.

2 & 3—*Pawtucket, R. I.*—Class AAA All New England Model Meet for CL, CLS, CLFS, FFG, OR, and TR. Arthur C. Bergeron, C.D., 55 Ricard St., Seekonk, Mass.

3—*Far Hills, N. J.* Class AA Bedminster-Far Hills Lions Club 4th Annual Control Line Meet for CL, CLS, and Beauty events. James T. Christian, C.D., Dunwalke Farm, Far Hills, N. J.

9—*New Britain, Conn.* Class AAA Connecticut State Championships for CLS, CLFS, and CL. Richard G. Matava, 358 Prospect St., Hartford, Conn., and Michael Adajian, 39 Brooklawn St., New Britain, Conn., C.D.'s.

9—*Akron, O.* Class AA Inter-City Wakefield Type Team Competition. Henry Thomas, C.D., 515 Mohawk Ave., Akron, O.

9—*Chicago, Ill.* Class AA Chicago U-Liners' 5th Annual Open Contest for CL and CLS. R. F. Antrim, Jr., C.D., 10752 S. Washtenaw, Chicago 43, Ill.

16—*Visalia, Calif.* Visalia Model Airplane Assn. Record Trials for FFG. Emory O. Hull Jr., C.D., P. O. Box 284, Ivanhoe, Calif.

16—*New York, N. Y.* Class AAA Tenth Annual Prop Spinners' Northeastern Championships for OR, FFG, and RC. William Fletcher, Contest Director, 8708 Grand Ave., Elmhurst, L. I., N. Y.
23—*Harrisburg, Pa.* 7th Annual Pa. State Exchange Club Meet. Entry is restricted to residents of Pa. Pending.

OCTOBER

6 & 7—*Woonsocket, R. I.*—Class AA Flying Fools' Fair for OR, FFG, CL, CLS, and TR. Thaddeus W. Wenclawik, C.D., 58 Providence St., Woonsocket, R. I.
21—*Visalia, Calif.* Visalia Model Airplane Assn. Record Trials for FFG. Emory O. Hull, Jr., C.D., P. O. Box 284, Ivanhoe, Calif.

NOVEMBER

18—*Visalia, Calif.* Visalia Model Airplane Assn. Record Trials for FFG. Emory O. Hull, Jr., C.D., P. O. Box 284, Ivanhoe, Calif.

DECEMBER

16—*Visalia, Calif.* Visalia Model Airplane Assn. Record Trials for FFG. Emory O. Hull, Jr., C.D., P. O. Box 284, Ivanhoe, Calif.
28, 29, & 30—*Orlando, Fla.* 2nd Tangerine Internationals. Pending.

Key to listing of events: FFG—Free Flight Gas; CL—Control Line Speed; OR—Outdoor Rubber; TLG—Towline Glider; IR—Indoor Rubber; OHLG—Outdoor Hand-Launched Glider; IHLG—Indoor Hand-Launched Glider; CLS—Control Line Precision (Stunt); CLFS—Control Line Flying Scale; RC—Radio Control; TR—Team Racing.

Contests designated "Pending" mean the application is before the proper authorities as we go to press; "Record Trials" mean no prizes, but a chance at cracking the records; "Class A" is a meet with restricted entry; "Class AA" is a meet with unrestricted entry; "Class AAA" is a state-wide or regional meet; "Class AAAA" is a national or international meet.

Fokker D-VII

(*Continued from page 33*)

D.VI came model *V.11*, very closely resembling the *D.VI*, but slightly larger overall and powered by a 160 hp Mercedes. This airplane was the forerunner of, and inspiration for, the Fokker *D.VII*, which it resembled very closely.

The Fokker triplane, and the *D.VI* had acquitted themselves very well at the Front, and the *V.11*, late in 1917 showed some promise. At least, it was an airplane which could be used as the basis of an improved model. All Fokker needed was the chance to prove that a redesigned *V.11* with a Mercedes could do all he said he could make a plane do with that powerplant.

He got his chance early in 1918. The German Air Ministry conducted a competition in February of that year for single seat pursuit planes to replace 1916 and 1917 models still in service. Notice of the competition was posted late in 1917, giving all companies entering planes plenty of time to finish their ships. All the big names were entered: Pfalz, Roland (L.F.G.), L.V.G., Albatross, Seimens-Schuckert, Rumpler (with the *D.I*) and of course Fokker. While a number of more or less standard equipment and performance specifications had to be met, the outstanding requirement was that all ships be fitted with the Daimler Mercedes 160 hp engine.

In order to come within the payload and performance requirements, Fokker did a complete redesign of his *V.II*. The new ship, designated *D.VII*, was slightly larger and heavier, with aerodynamic and structural refinements. The resulting plane had quite a deep fuselage forward, and to properly distribute side area, Fokker added the *D.VII's* triangular vertical fin. Preliminary tests showed that the prototype *D.VII* was directionally unstable, yawed violently under certain wind conditions, and spun at the drop of a hat. On the plus side, the ship was extremely maneuverable, climbed well and was very maneuverable at high altitudes. Its good characteristics were outnumbered by the bad, however, and Fokker himself was afraid of it.

The solution, as far as Fokker was con-

cerned, was to put the ship back into the shop and add some more side area at the rear. This he did over one week-end, by cutting through the longerons, welding in an extra two feet of fuselage and enlarging the rudder and fin in area. By maintaining the same outlines, he was able to re-exhibit his new ship without any apparent differences from the one he had put through its paces prior to its reconstruction. Test hopping the *D.VII* again, Fokker found that the spinning tendency had disappeared, directional stability was vastly improved, without noticeable loss in the good characteristics.

This *D.VII* prototype won the official competition, and production of the ship, incorporating additional refinements, was begun in March, 1918. Fokker received the first order for his factory, but German authorities put so much faith in the new ship that they soon had other firms, including Albatros, building the *D.VII* on a royalty basis.

Wings of the Fokker *D.VII* were perhaps of even greater interest to W. W. I engineers than was the fuselage. (Main attraction of the fuselage, described last month, was the use of welded steel tubing for a production airplane. Steel tubing had been used before to a limited experimental degree.) Two basic departures from standard practice were involved in the *D.VII's* wings: first, the extremely thick airfoil section and; second, the elimination of external lift and drag bracing wires resulting from using deep spars. As far as contemporary engineers were concerned, the problem boiled down to whether the resistance saved by eliminating external bracing was or was not cancelled by the added drag of the thick airfoil. Only wind funnel tests could prove this, and Fokker, like most other W. W. I manufacturers, was too busy keeping up with basic developments to bother about scientific testing.

Spars of the Fokker *D.VII* wings were of the box type. Heavy top and bottom flanges were built up of two-ply laminated wood. These members were connected by thin three-ply webs which formed the face and back of each spar. Spars were tapered towards the wing tips both in plan and front elevation. Except for points where other members such as struts or compression tubes were attached, the spars were hollow. Attachment points were filled with wood blocks to take shear loads.

Ribs were built to a peculiar Fokker airfoil which varied along the entire span of both upper and lower wings. These members were made of sections of thin three ply held in place by triangular vertical pieces nailed and glued to the webs and spars. Capstrips were made in two halves tacked and glued to each side of the rib web so as to follow the profile contour. Tacks, thus driven completely through both capstrip halves and the rib web, were upset on the pointed end to hold them in place. Rib webs were left solid except where control cables or internal wire bracing passed through. Vertical stiffeners were used frequently to reinforce the rib webs under vertical loads.

Leading edge of both *D.VII* wings was a thin three-ply "shell" wrapped around the rib noses back to the front spar, where it was finished off in a serrated edge, the points of which were tacked to the spar, between the ribs. Beneath this plywood leading edge were two spanwise stringers, one on the upper and one on the lower surfaces of the rib noses.

Trailing edges were steel wire held in place at rib tips by a small metal clip, except in the ailerons, where the wire was strung through holes drilled in the steel tube rib tips. Forward of the wire edge in both wings was a square spanwise auxiliary spar securely tacked to the rib webs and which acted as a rib tip stiffener.

Wingtips on the *D.VII* were made of solid wood routed out to a "U" section and attached to both spars, the leading and trailing edges. Additional reinforcement was provided in the form of cloth tapes running alternately over and under the ribs between the spars and the rear spar and the trailing edge.

Ailerons were fitted to the upper wing only, were aerodynamically balanced and made entirely of steel tubing of various diameters welded on assembly.

LENS HOUNDS

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The upper wing was attached to the fuselage in a novel manner. A tripod of stuts welded to the body on each side terminated in a fitting which was attached to the front spar. The rear spar was similarly attached to a single strut.

Lower wing, made in one piece, was attached to the fuselage by four bolts. It was set in place by dropping a short section of false longerons which were hinged forward and which, when the wing was in place were brought up and attached at the rear. This trap-door like affair was fabric covered and made an extremely clean lower wing attachment possible.

D.VII interplane struts were made of three lengths of streamlined steel tubing welded to form an "N". They were attached by the standard German ball and socket fittings.

As far as World War I pursuit planes were concerned, the Fokker *D.VII* was a big airplane. It was 22' 11-1/2" in overall length and had an upper wing span, including aileron overhang, of 29' 3-1/2", and a lower span of 23' 4". Chord of the upper wing was 5' 3", and that of the lower, 4' even. Total wing area was 236 sq. ft. and the area of the wing on the landing gear was 11 sq. ft. It must be remembered that dimensions varied from plane to plane for numerous reasons, sometimes as much as several inches in overall length, particularly when different propellers were fitted. With W. W. I planes, dimensional conformity was not as important as it is today, where a slightly wavy skin on a jet fighter will throw its balance out of line. Dimensional variation also was due to the fact that tooling in 1918 was crude, workmen inexperienced, and materials unpredictable.

Weights of the Fokker *D.VII* varied as much as the dimensions. From a German source empty weight is given as 1540 lbs. empty and 1936 loaded. Two Fokker *D.VIIs* captured intact by the French and weighed showed one to be 1622 lbs. empty, the other 1515 lbs. empty and 1995 lbs. loaded. Wing loading, therefore, was around 8 lbs. per sq. ft., and power loading approximately 12 lbs. per sq. ft.

Performance of the Fokker *D.VII* also has

(*Continued on page 48*)

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been a matter of controversy over the years. Official German sources give the top speed as 200 kilometers per hour at 1000 meters altitude. This converts to about 125 mph and is a maximum speed—all out. Cruising speed was about 110 mph. Some figures obtained by the French government as the result of flight testing a *D.VII* are interesting: They found the top speed at 3,300' to be 116 mph; 114 at 6,500'; 110 at 9,900'; 103 at 13,200'; and 95 mph at 16,000'. That was with a 160 hp Mercedes.

A surrendered *D.VII* was tested at McCook Field (now Wright Field) after the war. This ship was equipped with a Liberty 6 cylinder engine, very similar to the Mercedes, but with a rating of 215 hp. Weight empty of this ship was 1,538 lbs., and loaded it tipped the scales at 2,179 lbs.

At sea level its top speed was 120 mph; 115 at 6,500'; 111 at 10,000'; 97 at 15,000'; 92 at 15,900', the service ceiling; and 76 mph at 17,500, the asolute ceiling.

According to official German sources, French test reports and performance of the McCook Field *D.VII*, this type climbed, respectively: to 6,500' in 7.7 min., 8.18 min., 7.7 min; to 10,000' in 13.2 min., 13.49 min., 14.2 min; to 13.200' in 15.5 min., 22.48 min., 28.6 min. Any way you look at it, the *D.VII* was not a sensational climber.

All three sources agree that the *D.VII* stalled out at about 55 mph, which would be its approximate landing speed.

If specific details of the Fokker *D.VII's* performance didn't scare the daylights out of Allied pilots, its flight characteristics certainly did. Outside of the Fokker triplane there probably was no more maneuverable airplane during W. W. I than the *D.VII* Fokker. This was the characteristic of the prototype *D.VII* that scared the daylights out of Anthony Fokker the first few times he tried it out—before he added the extra length to the fuselage.

D.VII was extremely sensitive to all controls, responding like a well trained horse. Its lateral control was effective through the stall, and even at speeds almost at the stall, the elevators and rudder could be depended on to respond immediately. Stick forces increased with speed, as it did with all the W. W. I planes, but with the *D.VII* the response was still there. At altitudes, instead of slipping off in a tight turn, the *D.VII* would hold on. This made it a good high altitude fighter. Stalling angle of the *D.VII* was phenomenally high. This permitted the pilot to shoot almost vertically upward and gave the ship the reputation of being able to "hang on its prop". The *D.VII* was easy to fly, because it responded so beautifully, but it was not a stable ship, and could not be flown hands off.

The *D.VII* would take off quickly and with a short run. There was some tendency to swing left because of torque, but the offset of the fin took care of most of this. In a climb it was tail heavy. This characteristic also was noticeable in level flight with full throttle, but by adjusting the throttle, a balance could be established. With power off, it became nose heavy. The ship landed easily; stalled off nicely and used up very little runway, but was difficult to taxi in a wind.

That the Fokker *D.VII* was a good airplane is proved in the judgment of German authorities in ordering it in such large quantities; that it was no super-ship is attested by the German pilots—some of them top aces—who lost their lives in it. Aside from the military aspects, it was a delightful airplane to fly.

And from the historical standpoint, the Fokker *D.VII* always will hold a special significance as one of the most interesting airplanes ever built.

Capt. Oswald Boelcke and Max F. Immelmann, he of the Immelmann turn, made famous the Fokker E-2 and E-2, detailed plans of which will be found in October Model Airplane News. Plans are by Joe Nieto, text by Bob Hare.

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Planes in the News

(*Continued from page 13*)

faired at the leading edges, and the center-of-gravity shift must be compensated for. The wings are mounted on a vertical pivot located at the intersection of the wing root and the fuselage. The inboard portion of the wing leading edge is modified to a circular-arc section in plan view. This arc slides inside a similar fairing which is rigidly attached to the fuselage side. At all times, the gap between them is at a minimum. Leading edge slats are installed to increase lift around the stall. Dive brakes are located on the fuselage nose, right under the painted designation *X-5*. They are opened hydraulically until nearly perpendicular to the fuselage.

The engine, an Allison *J35-A-17* axial-flow turbojet rated at 4900 lbs. of sea level static thrust, is slung in the belly. Fuel is located above it, and the space between it and the engine is used to house the inboard end of the wing when the wing is fully sweptback. The air inlet for the engine extends straight aft to the front of the engine. This means that inlet duct losses are minimized. Tailpipe length is also at a minimum, reducing losses there.

Cockpit of the *X-5* is a clean design. By inclining the bottom rail, Bell engineers gave the pilot good visibility at the expense of very little protrusion above the fuselage lines. The cockpit is pressurized and air-conditioned. The canopy and seat are jettisonable in the event of flight emergency.

In contrast to the brilliant orange of the Bell *X-1*, the *X-5* is painted white. This is for better visual tracking at altitude, although radar tracking (not bothered by the color of the paint) will also be used. Wingspan of the *X-5* is 32' 9", presumably with wings fully extended. Length is 33' 4", and height to tip of fin is 12' Gross weight is about 10,000 lbs. The primary purpose of the *X-5* is to investigate the effects of different degrees of sweepback in flight, particularly at transonic speeds.

And as a new research plane is added to the sky over Edwards AFB, the skies over Germany's Soviet sector hold an increasing number of Red stars. One of them is different.

The first reports of a new twin-jet Russian light bomber began to appear about six months ago. First drawings showed a plane of the general lines of the Douglas *B-26 Invader;* first notes identified the craft as a Tupolev design, the *Tu-10*. The designation is still provisional, but lately the plane has been appearing in large numbers in the Soviet zone of Germany. Fortunately for us, it has been possible for observers to see these craft from various vantage points. One of these observers, a very competent German, has supplied notes and material for the three-view from a series of personal observations of the plane over a period of several weeks.

As the drawing shows, the plane is a shoulder-wing, twin-jet layout, with its chief recognition feature being the sweptback tail surfaces.. Wingspan is estimated to be about 65 to 70'; length, between 59 and 62'. Estimated sea level high speed is 560 mph. Landing speed is down around 90 mph. The plane is of all-metal construction and is unpainted, with two exceptions: the red star insignia, and a bluepainted fairing (presumably for radar) on the underside of the nose.

Two 23 mm. cannon are fuselage-mounted on either side of the nose just aft of the windowed portion. Four rocket racks mounted under the inboard wing panel complete the forward-firing battery. There is also a tail-gun position which mounts two of the 23 mm. cannon. Main landing gear retracts forward into the nacelles, and the wheels turn through 90 degrees to lie flat. The doors are bulged to house the gear. The nose wheel is double and retracts aft.

These planes have been observed in squadron service at Jueterbog and Oranienburg in the Red zone. Ex-American *B-25 Mitchell* bombers were used by the Reds for transition training, but there were many *Tu-10*

(*Continued on page 52*)

crashes occurring soon after pilots were posted to them. So the latest variant of the *Tu-10* is a trainer which is basically the same craft, less armament, radar and glassed nose.

In sum, it appears as if the Russians have a competent plane here which could be a troublesome adversary in quantity. It also shows that they still consider the job of ground cooperation as the prime duty of airpower. And as long as they keep thinking that way, we've got the ball.

The Russians add one, and the British add one. The long-heralded Vickers *660*, four-jet heavy bomber for the Royal Air Force, is now in quantity production. It had been ordered into the factory straight off the drawing boards. The craft is powered by four Roll-Royce *Avon* engines.

There is something of the *Canberra* line in the fuselage of the *660*. Comparing the fuselage size with the man alongside, the diameter appears to be about 11 ft., and length about 85 ft. The wing layout is swept-back, with a chordwise extension forward at the inboard end to accomodate the engine air inlets. These ducts feed the engine, placed two on each side, and discharging through the trailing edge of the wing. Shadow of the horizontal tail shows it to have a narrow chord, and to be sweptback also. Main landing gear retracts outward into the wing. Wheels are single and tandem. A dual nose wheel completes the landing gear; it retracts into the fuselage.

The new Vickers bomber is slated to replace the *Lincolns* and *B-29* heavies now in service with RAF's Bomber Command. Later, there may be other four-jet heavies bearing the names of Avro and Handley-Page.

The usual vague performance figures are given for the *660*—speed is "faster than the *Canberra*" and ceiling in excess of 55,000 ft. That should make the craft capable of more than 650 miles per hour. And it should have excellent altitude characteristics.

Exit the Beep Box

(*Continued on page* 30)

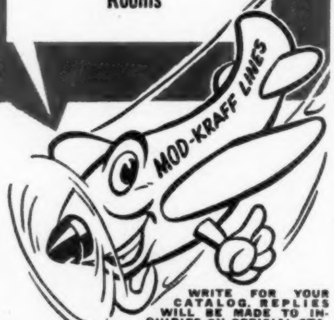
ment in some way to apply to suit a lever action control box?

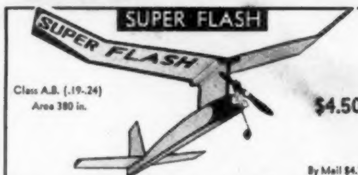
A standard Control Research escapement kit was used but there is no reason why the idea cannot be applied to other escapements. A new control arm was made as in Figure I so that it would have the standard two positions, right and left, but only one neutral, and a new pawl as in Figure II that was offset so that the pawl tip that engages the neutral position is only in line with the neutral of the control arm, and the two tips of the control arm (right and left rudder) are in line only with the other pawl tip that engages when the escapement is closed. Thus, as the escapement is activated, it requires a closed contact, and hold, to get one rudder movement and, when released, the escapement returns to neutral. To get the other rudder movement, it requires a closed contact, and a very short release followed by a second closed contact and hold. Upon release of that position, it also returns to the same neutral. For example; to get left rudder it would be one held impulse—and to get right rudder, it would be two impulses, the second being held.

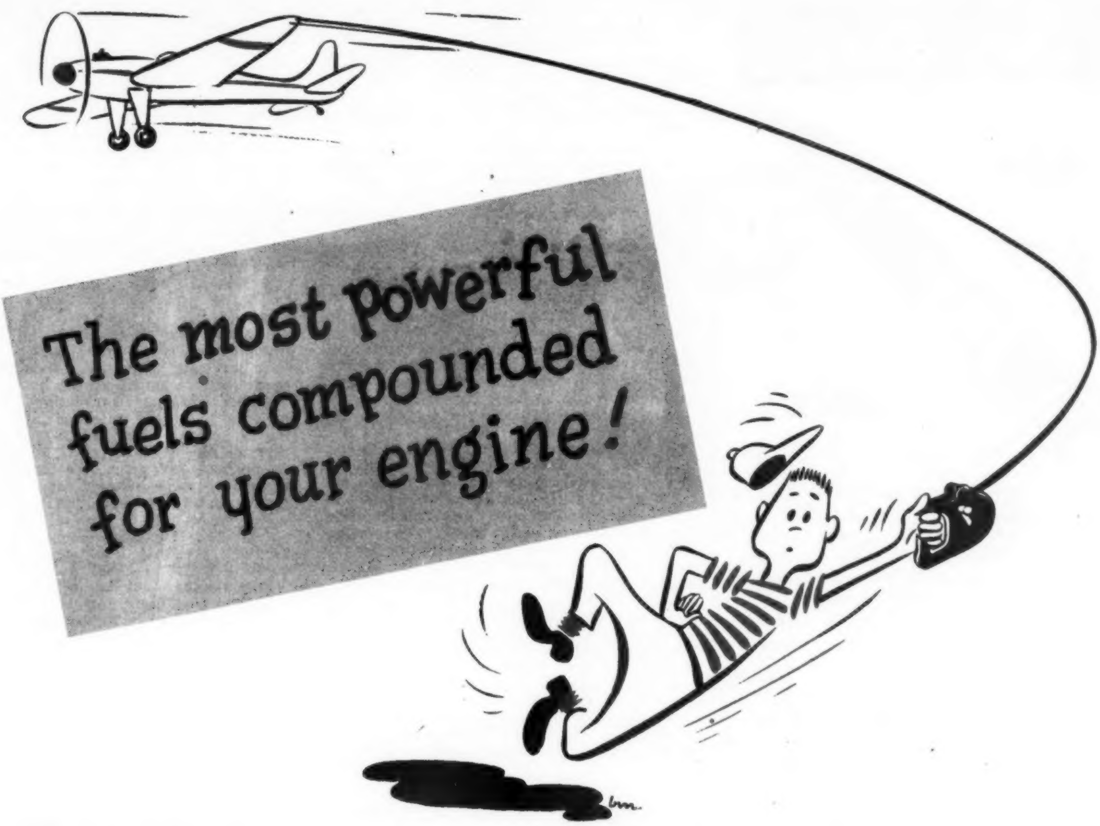
Now to return to the switch box. The problem has been simplified as the escapement will always return to neutral when released. By having neutral in an upright position and contacts on both left and right throws, we make it a single contact one way and a long contact, a short break, and a hold contact the other way. I found it necessary to keep the speed and action, particularly on the double contact, at the same speed each time so used a two-pole, three-position lever-action shorting type switch with a positive index and adjusted it for about the same speed as the normal electric wall switch. When it is operated you do not hold the lever, but simply snap it as you would turn on a light. This switch was obtained from Allied Radio, 833 West Jackson Blvd., Chicago, Illinois, stock #34-021, type 1452, for 73c plus postage.

Slight modifications of the switch are necessary. Looking at it from the side, that does

(*Continued on page 54*)







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not have the spring, I filed off the rivet that held the permanent contact at the far right and moved that contact to the next holes to the right and reriveted it into position. A short piece of 1/16" brass tubing works well as a rivet. About half of the moving contact was filed away so that, when it engaged the permanent contact just moved, there was just enough left to make a good connection. This was necessary to give the spacing between the two "impulses".

The other change was on the opposite poles of the switch, the side with the spring. With a pair of long-nose pliers, bend the permanent contact, second from the left, toward the other middle contact until it is almost touching the moving contact when the switch is in upright position. It is also necessary to file off a little of the right end of the moving contact. It is a good idea not to file too much away from both moving contacts until you have wired the switch for by the filing you can govern the speed of the action corresponding to the speed with which you find it most convenient to operate the switch (see diagram for wiring).

When you have the switch operating correctly you can make a small box to protect it, approximately 2-1/2" long, 2-1/4" high and 1-1/4" deep. Mine was made of plexiglas. One side was screwed on so it would be accessible. This works very well. There is no reason why, with the escapement operating in this manner (one neutral), it would not be possible to add a third prong on the control arm at right angles to neutral position and, with possibly a four-position switch, incorporate motor control or engine shut-off. One rudder position would be operated by one impulse, the other rudder position by three impulses and engine control or cut off by two. Engine control would operate at only a neutral rudder position and engine shut-off would require some type of delay as it would pass through that position with each operation.

Test the Sandy Hogan

(*Continued from page* 15)

glued to each rib. The upper halves of the trailing edges, by inserting 1/16" x 3/16" balsa strip between them, as indicated, were nicely strengthened and pleasantly light in weight. Both wing and stab have the center sections sheet covered for additional strength.

To eliminate weight, we substituted colored *Silkspan* for the material supplied, obtaining a nice finish with five coats of clear dope and plasticizing the last one. The featured "Hoganamic" wing and stab construction, wherein the ribs are placed diagonally across the chord, instead of at right angles as in more conventional designs, seems to have nice warp-resistant qualities, judging from the test ship we built.

The rudder is of built-up construction, employing several die-cut pieces for the trailing edge, heavy strip stock for the leading edge and two built-up ribs. After assembling, the rudder is inserted between the two crutch longerons at the trailing edge and smoothly faired in with a sanding block. This method provides strength and eliminates the possibility of misalignment.

Though the drawings show an adjustable rudder tab and a piece of die-cut plywood is provided, we chose to eliminate this little gadget. The drawings show the tab set for a left turn but the instructions state that; "left rudder tab should never be used".

Two coats of wood filler on the fuselage and pylon, followed by two coats of colored dope and some hot fuel proofer just about completed the construction. The wing and stab were placed in their respective positions and held tightly with loops of 1/4" flat rubber. Both surfaces were keyed in place, after checking for correct alignment by the string and pin method.

Ready to fly, it weighed exactly 32 ounces, just what the man said. A check for balance prior to the flight tests indicated that the model balanced correctly longitudinally but had a left wing-heavy condition, probably caused by a piece of very hard sheet balsa on the left tip. This was corrected by adding clay to the right tip. Wing and stab incidence were checked by leveling a flat board and laying the fuselage on it. Then, measuring with a ruler at the leading and trailing edges of the lifting surfaces we adjusted each surface with balsa strips glued to the rests until the correct amount of incidence indicated on the drawings was obtained. With the flat bottom fuselage of this ship, we found this method of checking a little easier than trying to determine the thrust line on the side of the fuselage, as shown on the sketch on the plans. A dime-store bubble level and a 12" ruler are the only tools necessary. Finally, a check was made for right thrust, by again using the pin and string used for wing alignment and measuring from the leading edge of the rudder to each prop tip when horizontal.

As with all contest models, the pay-off is in the flying ability. So, cramming this big hunk of airplane into the old Studebaker, we chugged off to the local flying field. Although hand-launched glide tests are no real test, we ran with the *Sandy Hogan* and launched it gently into the wind. The weather was far from being ideal, strong gusts up to twenty miles an hour were blowing across the field and caused the ship to rear up like a yearling at the starting gate. As no bad tendencies or serious unbalanced conditions were evident after several tries, we decided to proceed with the power tests.

Not being able to obtain from our dealer an 11" *Air-O* prop recommended for the *Torp* in the instructions, we selected, instead, a 10-6 *Top Flite*.

Through a few years of close association with hot free flight jobs, we have gained a tremendous respect for them and always begin the test flights cautiously. The timer valve was set for a four-second engine run and double-checked. The 1-1/2 ounce tank was filled to the brim with panther juice and, several flips later, the *Torp* was snarling.

We have learned the hard way, that a good method of needle valve adjustment for a ship of this type, is to stand the model on its tail and lean it out until it reaches peak rpm. This method simulates the actual flight attitude of the ship and almost assures a perfect engine run, provided the tank is properly designed and located. Once the needle valve is set in this fashion, it's a good bet to leave it alone, except for any very slight adjustments to compensate for temperature and humidity changes. This assures one of at least one constant factor throughout the flight test and particularly during hot contest competition.

The engine mounting bolts were checked and the engine re-started, the timer released and the *Sandy H* was hand-launched into a very gusty wind, while we stared at it, heart-in-throat. Creaming a big job like this on the first flight is a crushing blow, but the *Hogan* stuck her nose in the air and started up. The short timer allowed the model to get about 50' in the air after a straight climb, and it flipped down without a stall and went into the glide. Starting to breath again, we observed that the glide was to the left in a large circle of approximately 300' diameter and though fast, was extremely flat.

As previously mentioned in this analysis, the rudder tab was omitted, so all our glide turn was obtained by shimming up the left side of the stab about 3/32". Any ship will glide toward the high side of the stab.

A floating gravity tab of die-cut plywood is provided in the kit and mounted on the tailing edge of the wing, close to the polyhedral break of the right wing tip. At the same time, the instructions call for it to be mounted on the inside of the desired glide circle and further state that the ship should glide to the left. So we left the gizmoe off. To date, the tilted stab seems sufficient and from experience, we know that it gives a nice transition.

Before attempting the second power flight, we installed a 1/32" thick brass washer behind the left side of the engine, giving approximately four degrees of right thrust. This was done after observing the straight climb of the first attempt, and after remembering the word of caution in the directions that power turn to the left is dangerous. The second flight showed a slow turn to the right under power and a slight, but not serious stall at the transition. Increasing the shim

(*Continued on page* 56)

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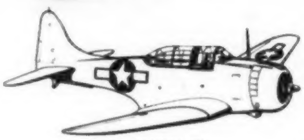
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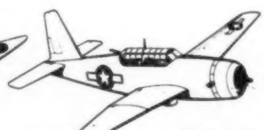
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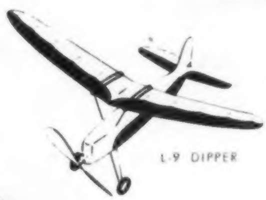
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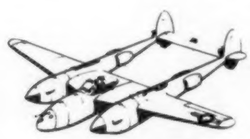
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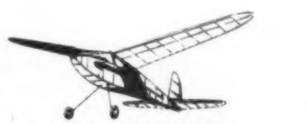
P-6 CLIPPER, JR.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under the left side of the stab by 1/16" reduced the glide diameter slightly and also eliminated the previously mentioned stall.

About ten subsequent flight tests, all in bad weather revealed no bad tendencies. A slight rocking of the wing tips under power was noticed, but may have been induced by the wind.

At this writing, flight tests have not exceeded a six second engine run and the ship is behaving satisfactorily, flown to the right with power on and left in the glide. In our opinion, manufacturers of kits of this type cannot be too explicit with flight and adjustment procedures and a single printed sheet devoted to this subject would be of invaluable assistance regardless of who makes the airplane.

One has to look far to criticize the *Sandy Hogan* kit; certainly nothing but a few minor points can be criticized. But if hairs must be split in the name of reader service, we found that the drawings show, in one place, former number six located where former number seven should be, and that number four proved a trifle short and was replaced by one made from scrap balsa. In the particular kit we obtained the three spade bolts for attaching the landing gear were missing. In a complex free flight kit, perhaps one should not be so exacting. At least, such criticism, however paltry, makes the favorable report more convincing.

For those modelers who, tired of the small A jobs and the even smaller AA models, the *Sandy Hogan 70* offers a chance, to try their skill on a larger contest job.

INDEX TO ADVERTISERS —SEPTEMBER, 1951

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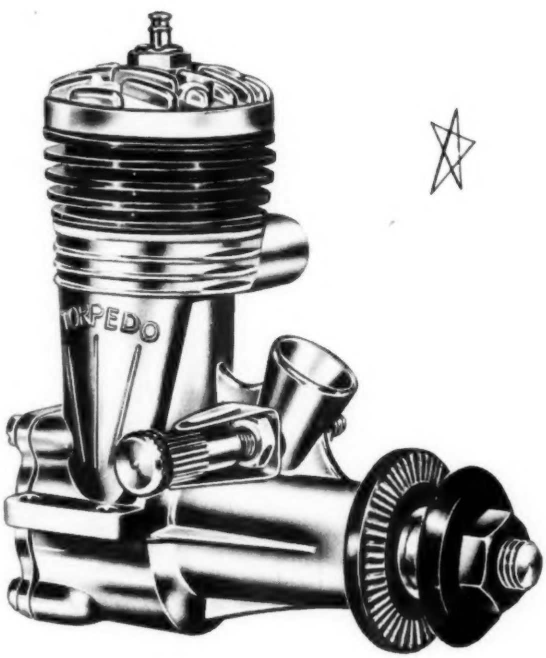

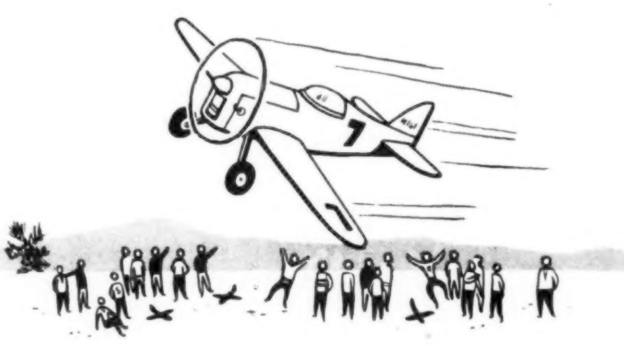

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